VERMONT LIFE

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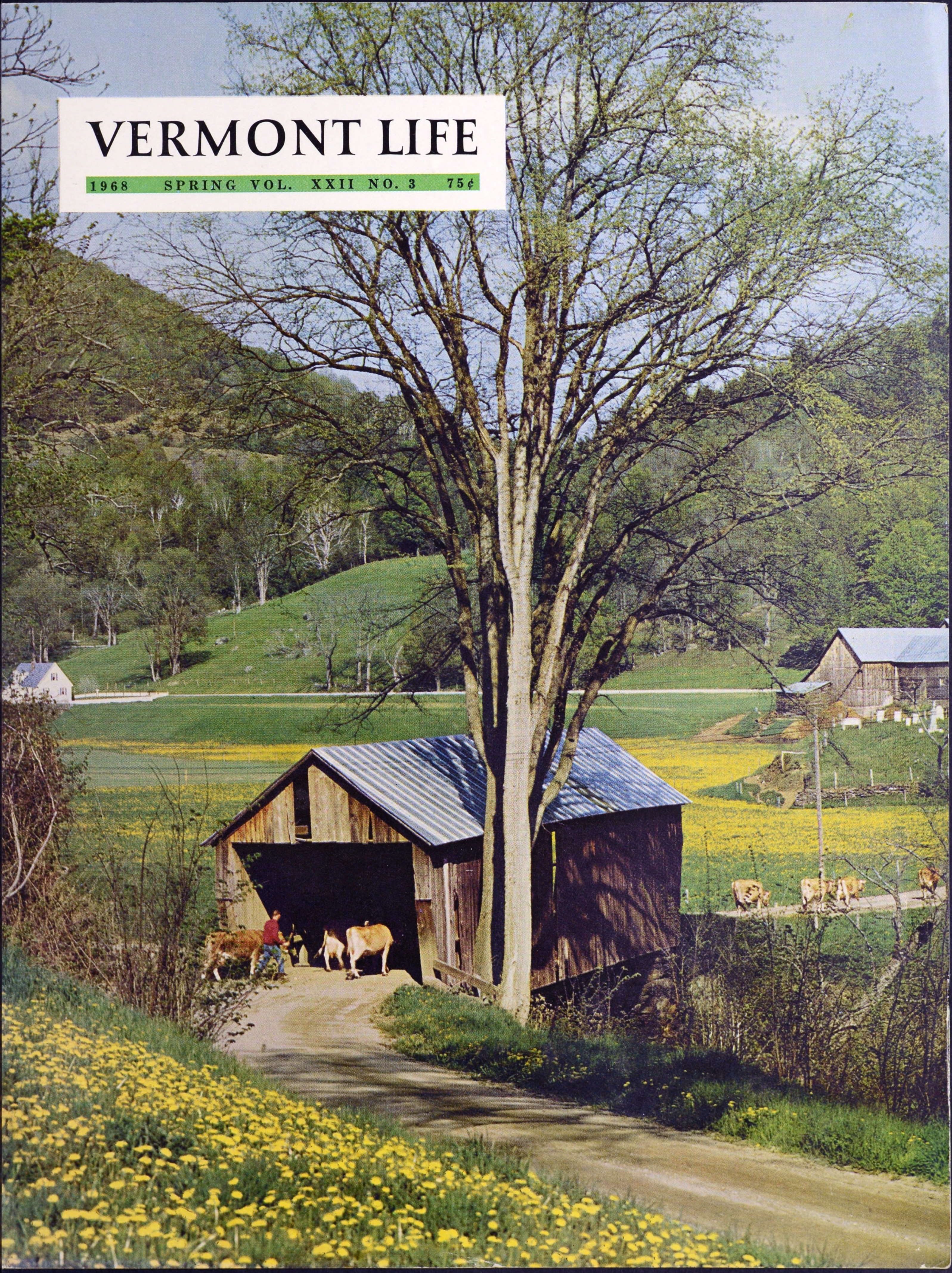

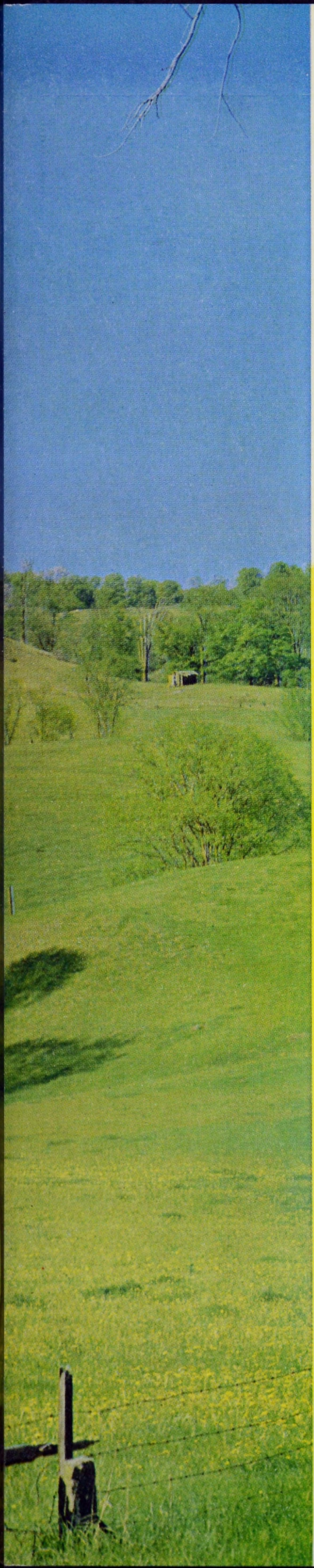

VERMONT LIFE

VOLUME XXII NUMBER 3 SPRING 1968

COLOR SPECIALS

THE BIG BRANCH 18 George B. Gordon *with* John Harris
THE HESITANT AWAKENING 26 *the changes of Spring in color*
COME TO APPLE COUNTRY 60 *a picture invitation*

PEOPLE & BUSINESS

THE MARBLE MOUNTAIN 2 Bullaty-Lomeo *film at Danby*
AVOCATIONISTS AT WORK 10 Laurence Hyman *at Bennington*
ANYWHERE BY AIR 15 Alan D. Sophrin

THE PAST

THE FRIENDLY GHOST 54 Virginia Downs *at Lyndonville*

NATURE

MOST WILD DUCKS 8 Hanson Carroll: *making nesting boxes*
IMPATIENT SPRING 22 Ronald Rood *with* Robert Candy
A BILLION-YEAR PAST 46 Barbara Chamberlain: *Vermont's geology*

SPORTS

WHITE SNOW, WHITE WATER 38 *Springtime canoeing, by* Clyde Smith
AID FOR AILING ANGLERS 42 Jerome Robinson *at the Orvis school*

DEPARTMENTS

VL REPORTS 35 *on coming to Vermont*
GREEN MOUNTAIN POST-BOY 56 *Notes on the passing scene*
FOOD 58 *Some like them white*

Left: *South Tunbridge farm*, HANS WENDLER

Covers: FRONT—*Cilley Bridge, Tunbridge*, LUD MUNCHMEYER

BACK—*Moss Glen Falls, Granville Gulf*, DICK SMITH

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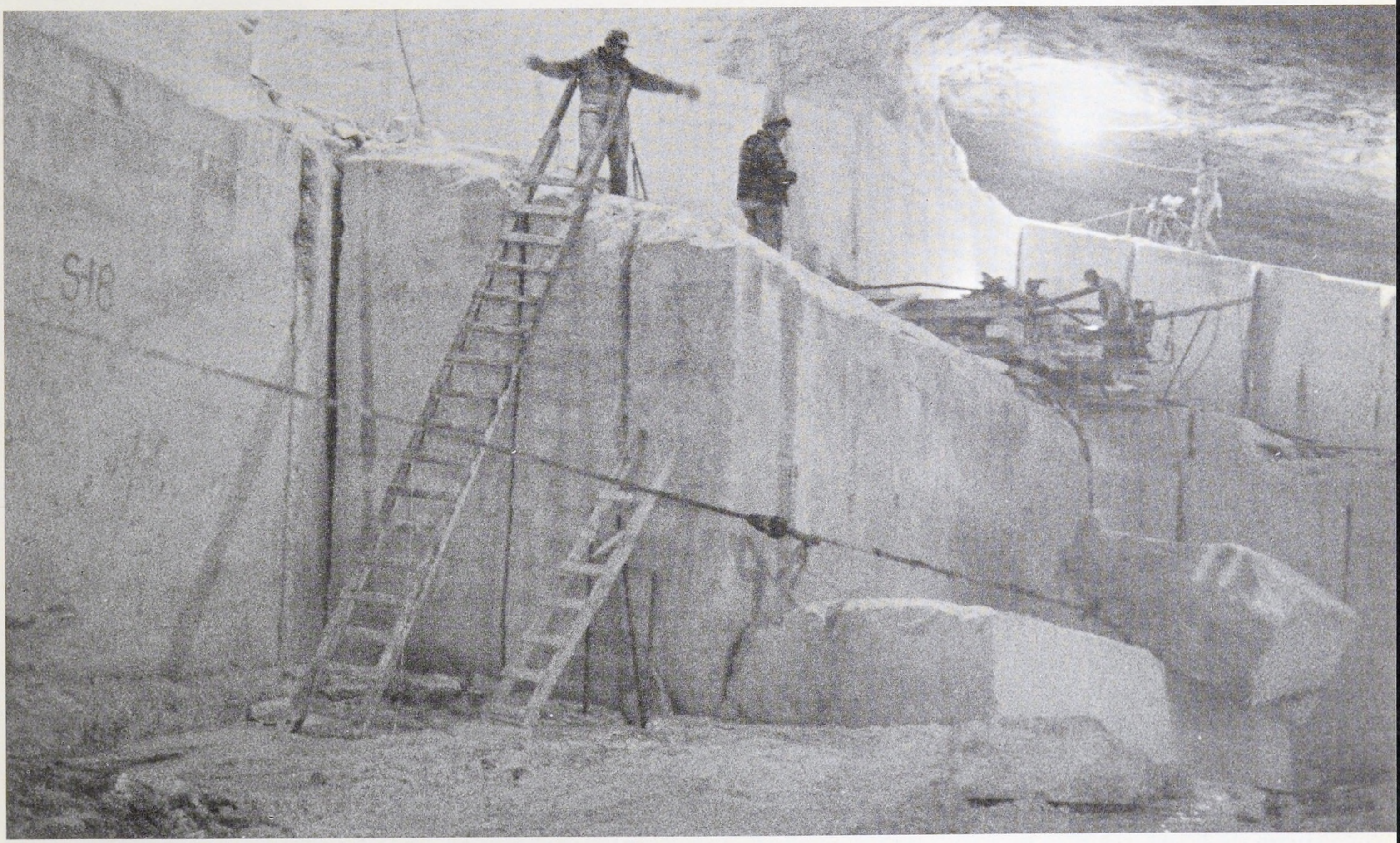
High above the Otter Creek Valley
men, hidden from sight, are
working throughout
the year to quarry out fine

Marble under the Mountain

for buildings all over the nation
by Edward Huss Jones
Photographs by Bullaty-Lomeo



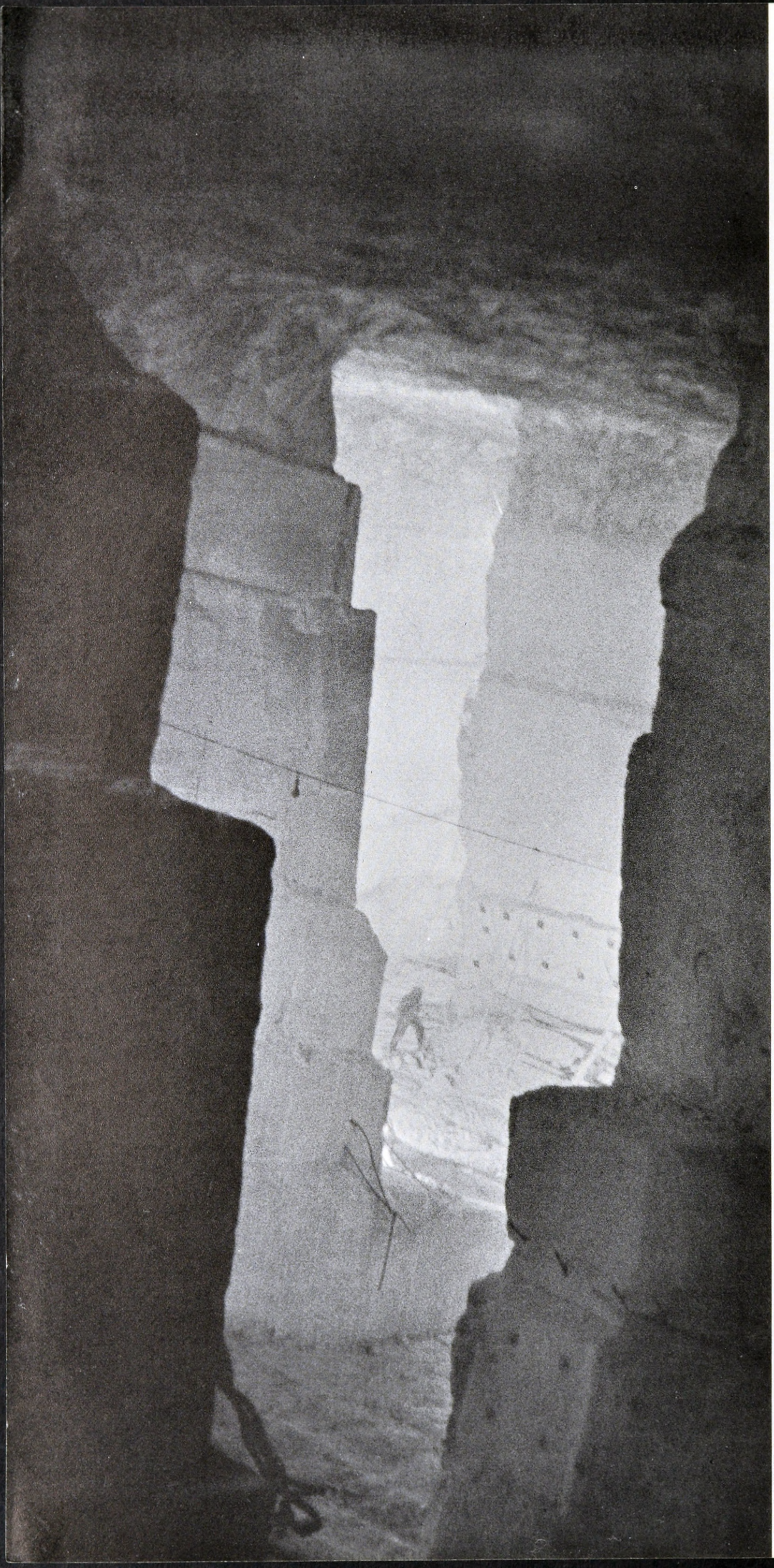
A supporting column is being left as new tunnels, above, are opened, and toward camera a huge block is readied for removal.
In color at left more stone has been removed to rail level in foreground.

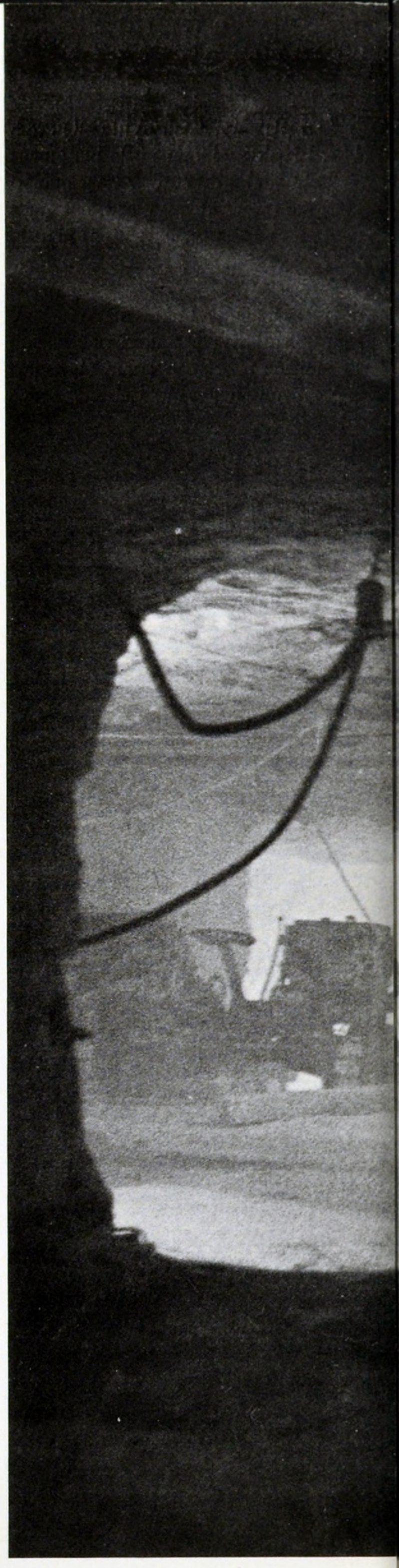
High above the valley highway near Danby a great hole cuts into the green, eastern slope of Dorset Mountain. Standing at the entrance to the Vermont Marble Company's Danby Imperial Quarry, a man may look across Otter Creek, far below, to the wooded slopes of the Green Mt. National Forest eastward.

A metal partition covers the entrance, and a door leads by a long staircase down into the largest underground marble quarry in the world.

If it happens to be winter, one notices it begins to get warmer farther down and into the mountain. It is 48 degrees there the year around.

The tunnel face and working areas now lie 1500 feet in and southward of the





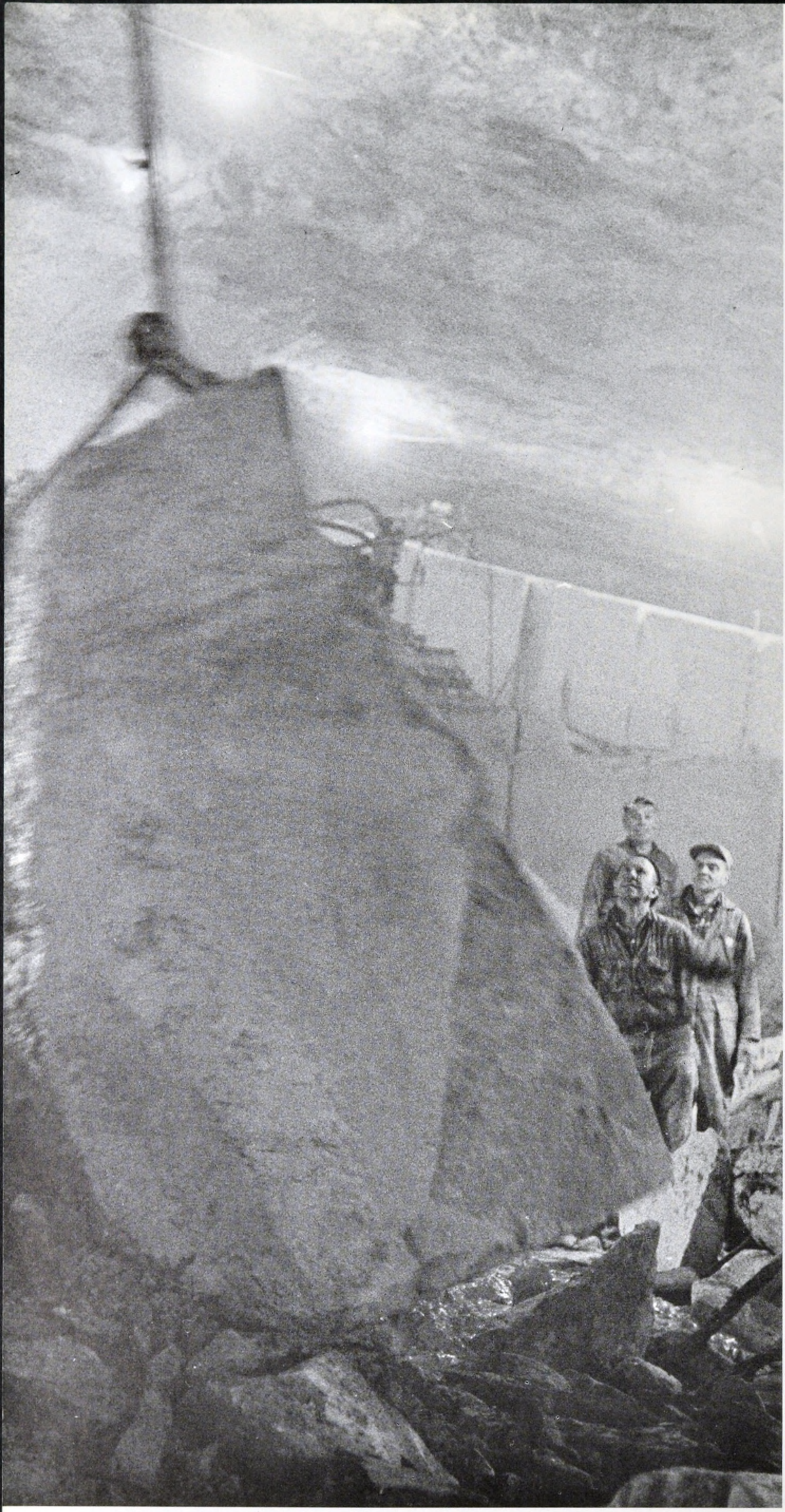
Through the soft white haze a quarryman, left, crosses a cavern-like corridor. Above, drilling equipment has been moved into a new tunnel, still with minimum headroom.

quarry opening. The Imperial tunnel was started by the company in 1907, though there was quarrying here as far back as 1827. A hundred feet in, they had come upon fine marble, which proved to be in a synclinal formation running northeast and southwest. The center area of fine stone is from 40 to 50 feet deep—but in layers (varying in thickness and color), the layers separated by beds of darker schistose rock waste. The worked area is some 400 feet in width.

One is amazed at the whiteness here; brilliant lighting shines on tunnels, ceilings and natural pillars. The quarry aisles form a kind of massive cathedral with a vaulted ceiling 60 feet above the 150-foot-long transepts which run, all crystalline white, in four directions.

Further into the quarry, a white mist obscures the views, and the noise of the machines is everywhere. From 100 to 180 men work here throughout the year.

They quarry the marble by first blasting seven-foot-high tunnels above and ahead of the marble layers. Then huge drills and channeling machines are brought in to make the vertical cuts into the fine marble. Long strips are drilled with layer hammers and wedged out, the huge blocks being



A rough-split corner block, left, is swung out of the way by a derrick cable. Below, workmen watch a long block being winched to the railhead, out of sight to the right.

The Vermont Marble Company regrets that visitors cannot be permitted at the Imperial Quarry because of possible danger and lack of viewing areas.

derricked onto railroad cars, to be pulled by cable to the quarry opening. Piers of stone 25 feet square, are left at 40-foot intervals to support the roof.

In front of the mountainside entrance, rough blocks of fine stone, weighing perhaps 25 tons each, are lifted by derrick to trailer trucks or onto the incline cable railroad, which drops 900 feet in its half-mile plunge to the rail siding on Route 7. The marble goes then to the West Rutland mills for cutting and to Proctor for its finishing.

An underground area of close to sixteen acres has been quarried here in the past sixty years, and each year as much as a million cubic feet of stone—waste rock and a smaller percentage of fine marble—is taken out.

The Danby Imperial marble is considered by many the finest in the world, not only because of its color and consistency, but especially because of the interlocking structure of its calcite crystals, which gives it remarkable density and strength. More than half of the Vermont Marble Company's domestic production—they have quarries also in Ontario, Tennessee and Colorado—now comes from Dorset Mountain. ∞

Most wild Ducks *nest to the north of us in Canada, but like these Scouts you could play host to the few that never migrate further than Vermont.*

Story and photographs by HANSON CARROLL

Ducks, like some Vermonters, always return to where they were hatched, and, given any encouragement, will raise their young there. But their lives are bloody, Red-Ridinghood sagas involving an army of predators: foxes, stalking raccoons, skunks, snakes, hawks and crows. Even turtles get in their licks. Often the average duck brood of nine will have only two survivors.

Hosting ducks in duck boxes can help offset this brood kill, and can add to one's enjoyment of seeing more ducks, whether for bird watching or hunting. The boxes offer additional protection against the predators, once the ducks start to use them.

Wood-ducks, by their nature, are the easiest to accommodate. They are fairly abundant and, like Mergansers and Goldeneyes, nest in trees or elevated enclosures.

Another common duck which may take up summer residence is the black. Normally she nests on the ground and, although crafty and expert in the art of camouflage, her first-floor vulnerability often provides lip-smackers for predators. But once the black has tried duck-box living, she'll not forget its comfort and security. The

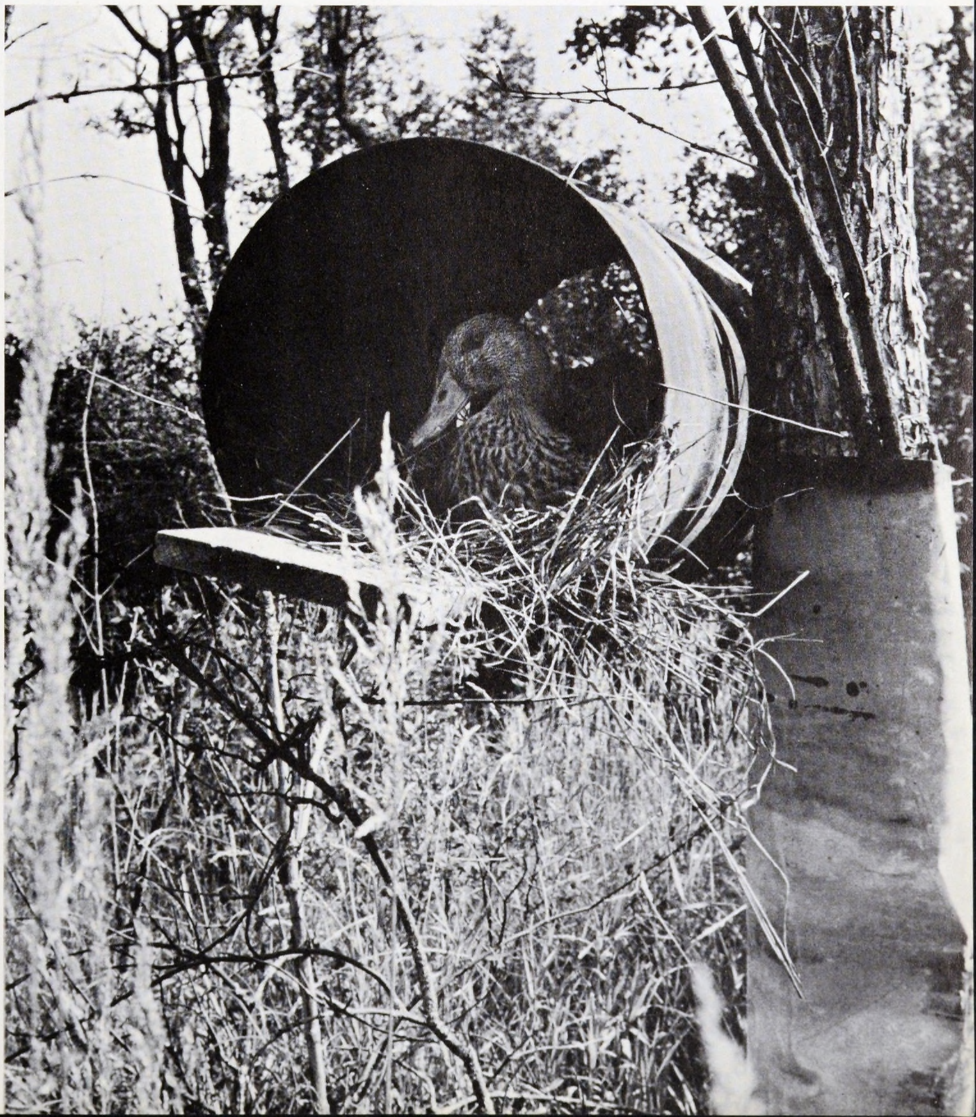
Wildlife conservation projects are of growing importance for Boy Scouts in Vermont. Here a troop of Norwich Scouts is building and erecting nesting boxes for ducks that might be attracted to raise their young in a natural waterfowl nesting area in the town of Norwich. The Scouts are shown above preparing their oil-drum nest boxes for transportation to the marsh in early spring. At right and opposite above, the boys are setting them up. Later in the spring, opposite below, a nesting mallard shows her appreciation of the Scout project.

odds on winning her over, however, are heavily against the conservationist.

Duck boxes improperly made and maintained can be more of a trap than a safe nesting area. They must provide proper elevation and ventilation and be properly mounted on shielded posts or trees. They also must be checked seasonally to insure proper bedding and isolation from enemies.

For larger ducks, such as blacks, acceptable interior measurements are 10 by 12 inches and at least 10 inches high. Small oil drums work well. Make a hole in the back for ventilation and a landing platform sticking out the open end about 10 inches. On all boxes the pole or tree used should be completely covered for at least 30 inches with tin or aluminum so there are no toeholds for climbing raccoons. Wood-duck boxes should have a minimum interior of 9 by 10 inches and 20-inch depth. These are mounted vertically with a three-inch entrance hole and small drainage holes in the bottom to keep the nest dry. All boxes should be set on or within a quarter-mile of water.

It's best not to go too near the nests once they're in use. They should be watched from a distance with glasses and the young never molested. It's probably best to reap your satisfaction from the occasional contented quacks that drift from the heretofore-silent marsh. ∽



Bennington's famous College
faculty off-campus presents
a meaningful yet startling
picture of

Avocationists at work

by LAURENCE J. HYMAN
Photographs by the writer

ONE OF THE LITTLE-KNOWN things about Bennington College is that most of the faculty are professionals in the fields they practice, but are for the most part amateur teachers. Although more than half the faculty happens to hold doctorates, some members hold no college degrees at all.

Bennington is noted for the degree of freedom it affords the students; equally valuable, however, is the immense amount of freedom afforded the faculty.

Almost every faculty member at Bennington is active in his own profession. He is also free to do as he pleases during a three-month winter work term (when all students leave the campus), in addition to summer vacations.

During these breaks in the academic year, few faculty members vacation. The painters paint, the composers compose, the writers write, the musicians, dancers and drama faculty perform, and the scientists and social scientists do research or attach themselves to other universities.

Not all faculty members, however, are engrossed in single professions. Many have preoccupations unrelated but equal in importance to their academic interests. For example: there is Reinhoud van der Linde, a mathematics teacher, also a professional organist; Claude Fredericks, a poet and playwright, is a printer; George Finckel, a cellist, sells antiques; and Gunnar Schonbeck, a music teacher, invents musical instruments.

George Finckel has taught music at Bennington since 1942, and three years ago he started an antiques business on Route 7 outside Bennington. Although he has been involved in the business commercially this short time, he has been collecting antiques and curiosities for most of his life.

He started while a student at the Eastman School of Music, by finding rare books and furniture and selling them to local antiques dealers. Throughout his professional career as teacher and concert cellist he has continued to buy and collect antiques and rare objects while on concert tours. Some he has sold to dealers, some he has given or traded to friends, but most he has stored in barns around Bennington.

He first discovered how lucrative the business was, he says, when he bought for $150 from a family in Canada an 18-foot wooden carved crucifix. On the way home he was offered $250 for the piece but refused to sell it. He sent photographs of the sculpture to several friends, and then leaned it against the side of his house. "I never want to sell anything right away," he says. "I like to leave it around for a while and let it work on me."

A few weeks later he was offered $1,750 for the piece and promptly sold it. Six months later he discovered that the crucifix—actually an 18th Century figure from the Gaspé—had been bought by the Museum of Montreal.

"It gave me a great confidence in my eye," he recalls. "I liked the look of it, even though I didn't know that much about antiques at the time. It had a fine sculptural quality about it, and it reminded me of El Greco's work. It was both sophisticated and primitive."

Since then Finckel has continued to accumulate rare objects on trips, mostly in Canada and northern Vermont. "The antiques business has really changed in the past 25 years," he says. "In the old days everybody was going around to farmhouses, cleaning off porches and attics. Now dealers go from shop to shop looking for 'sleepers'—objects more valuable than the owner is aware of—to sell to other dealers."

"Because this country is running out of easily-available antiques, the character of the merchandise is changing," he maintains. "I'm not interested in traditional things like spinning wheels and old crocks, and I concentrate instead on architectural decorator items." He collects sawn wooden sculpture from early Victorian New England houses, old doors, abandoned wooden church ornaments, early windows and what he describes as "oddball things." He has become well-known among New York dealers for his collection of old New England gold-lacquered picture frames.

"I have a sort of a reputation among dealers in Vermont," he says. "They save crazy things for me that nobody else would want. I don't want conventional things; I like horses with three legs, or no legs at all, odd statues, old toys, even things with no age value at all."

Although antiques are not at all related to music, Finckel feels his eye for rare objects is related to his sensitive ear. "I think when you train one of your senses all the others become more acute. Of course, it's the way you look at things; sometimes very primitive things start to look modern to you, and you can imagine all kinds of uses for them."

Finckel says he has learned a great deal about history, particularly New England history, and about art, in his experiences with antiques. And his knowledge of contemporary art may be heightened, as well, by a weekly poker game with painters Kenneth Noland and Jules Olitski.

Gunnar Schonbeck has taught music at Bennington since 1945, specializing in instruction in brass, woodwind and stringed instruments. When not teaching, or teaching one of several groups of community children, he works making and repairing musical instruments at his "musical hardware store" in North Bennington. (*See* VERMONT LIFE, *Autumn, 1962, P.* 62.)

Not only is Schonbeck expert at repairing almost any type of musical instrument, he has developed variations on existing instruments, and often invents new ones to meet his musical needs.

He attributes his interest in the modification of instruments to the existence of many gaps in the musical sounds and tonalities available with conventional instruments. He works constantly with friend and colleague Henry Brant (also a teacher of music at Bennington) in developing new ways to make new sounds with existing instruments. Often Brant, a composer, writes music especially for these new instruments, or asks Schonback to modify instruments to make them capable of playing unusual scores.

A little more than a year ago Schonbeck began experimenting with the development of musical instruments made of Vermont marble. By arrangement with the Vermont Marble Company, he has designed and tooled an entire marimba of marble strips. He has also made a set of Chinese gongs, and a clarinet entirely handfashioned of marble, is nearly completed. Other instruments are in various stages of development.

"There's nothing at all new about marble instruments," Schonbeck claims. "The Chinese have had them for thousands of years. Stone has never been used for making instruments in the West, and we know very little about its qualities of resonance and its acoustical properties."

His work has necessarily been accompanied by a great deal of research at the Library of Congress in Washington and museums on the East Coast. Many of the specifications and dimensions for his instruments have come from books on ancient Chinese instruments and musical theory, in which black stone (marble) was the basic substance.

Schonbeck plans to develop other types of marble musical instruments ranging in complexity from flutes and pipes for pipe organs to stringed instruments, woodwinds, and musical sculpture. The sculpture, as he sees it, could be of enormous dimensions, left in parks for people to play at will with mallets and sticks.

"You could make marble organs and other instruments suitable for playing outdoors," he says. "We have found that marble reacts to weather and temperature changes far less than either wood or steel. The big problem with organ pipes is that they are constantly expanding and contracting and changing pitch."

Schonbeck has also discovered that marble seems to have many of the same musical properties as wood, and many qualities that wood does not have. Not only can a larger range of sound be made available to the composer, he says, but new and different kinds of sound are possible. He sees the production of instruments eventually with more range than the piano keyboard, and tones approaching the ranges of the pipe organ. In addition, he says, instruments made of marble are no harder to make or more expensive, once the tools are fashioned, than contemporary instruments.

According to Schonbeck, the Vermont Marble Company executives and workers are surprised that marble, often regarded as a very fragile and breakable substance, can survive the punishment he inflicts.

"They can't believe it won't break when I play it," Schonbeck says. "I can play the

An old statue appears to monitor George Finckel, seated on antique whalebone furniture, as he tootles an unusual horn.

Gunnar Schonbeck's experiments with resonances of marble are leading to new fields of instrument construction and composition.

marimbas with heavy metal hammers with no problems."

"Another thing we can do," he says, "is to help the industry resolve some of the problems they have, such as unexpected cracking, problems related to fastening slabs of marble to other structures, and destruction caused by vibration."

Among Schonbeck's immediate plans for his marble instruments, once they are finished, is the composition and performance of musical pieces for orchestras comprised entirely of marble. He and Brant are hoping to design a permanent outside orchestra, and to give "stone concerts" late this spring.

Claude Fredericks, a poet and playwright and teacher of literature at Bennington since 1961, operates a printing press in his large old farmhouse in Pawlet.

He started printing commercially with a friend twenty years ago in a converted basement butcher shop in New York. As The Banyan Press, they published books of poems by unknown poets and accepted occasional commissions. Most of their work was on a limited-edition basis, with rarely more than 300 or 400 numbered copies issued. Fredericks had previously worked with a printer for a period of a few months, and was primarily self-taught.

Feeling strongly that poetry could be published economically if the margin of profit were reduced and the printer served as the publisher, Fredericks and his partner did the entire publishing job themselves. Both shared editorial responsibility and decided together what would be printed, and both set type, although Fredericks did all the presswork and designing himself. Beyond the physical publishing of work, they further attempted to cut expenses by doing the binding, distributing, mailing, and billing themselves.

In 1948 they moved the press to Pawlet, hoping that having a press in the country would further reduce the costs of producing books of poems. The partnership was dissolved in 1950, but Fredericks has remained in Pawlet, writing and publishing. The name of the press was dropped, and now Fredericks simply publishes under his own name.

Fredericks continued to print, even with a growing commitment to daily writing, because, he says, he felt a need for some manual activity. He spent mornings writing, afternoons printing.

Since he began teaching at Bennington and has continued to write daily, little time remains for printing except during summers and winter work terms. Even when he is able to work at printing for extended periods, he works slowly and meticulously, doing every aspect of the publishing himself. He finds and edits manuscripts, sets the type by hand and later distributes it, cuts the paper by hand, and collates and binds the work himself. The issue of a limited edition of an 80-page book of poems, he says, takes him several months, working daily, to complete.

His press, which he calls "Theodora," is a 10 x 15 Golding Job Press, a hand-operated platen press. He operates it at about a third of its speed capacity in order to control the inking more carefully.

Fredericks now uses only a Garamond typeface for all his work. He feels the problems with contemporary design are related to the fact that there is such a limitless choice of possibilities, and that a lack of this variety makes the artist use his ingenuity and imagination more fully. Although he has several sizes of the single font, he uses variations very sparingly. As a result his work has style and consistency.

Fredericks spends a great deal of time in the choice of paper, and usually uses hand-made Italian or Japanese papers, both for cover and text stock. He feels the variety, intentionally limited in the typeface, can be achieved to a great extent with choice of paper.

Although he has published original manuscripts and poems by other writers—among them William Blake, Brother Antoninus, John Berryman, Wallace Stevens, Stephen Spender, Richard Eberhart, Gertrude Stein, Robert Duncan and James Merrill—he feels increasingly that he will soon begin publishing only his own poems.

Over the past twenty years Fredericks has published some 300 separate pieces, including books, pamphlets, commissions and what he calls "ephemera"—unbound editions consisting of a few pages and cover. Much of his printing is in the hands of collectors, and complete collections of his work are owned by the New York Public Library Rare Book Room and Washington University.

Reinhoud van der Linde has taught mathematics at Bennington since 1956. He is also an avid musician, and three years ago bought a full-size pipe organ from a church in Troy, New York, brought it to North Bennington and installed it in his house. Since then he has reconstructed the instrument in accordance with his own musical tastes.

A condition of the purchase was that he dismantle and remove the 3000-part, 50-year-old tracker organ in a single day, which he managed to do with the help of friends. His wife, Rosamond, and teaching colleague, Louis Calabro, assisted him in rebuilding the instrument in what is known as the Organ Room in the van der Linde house.

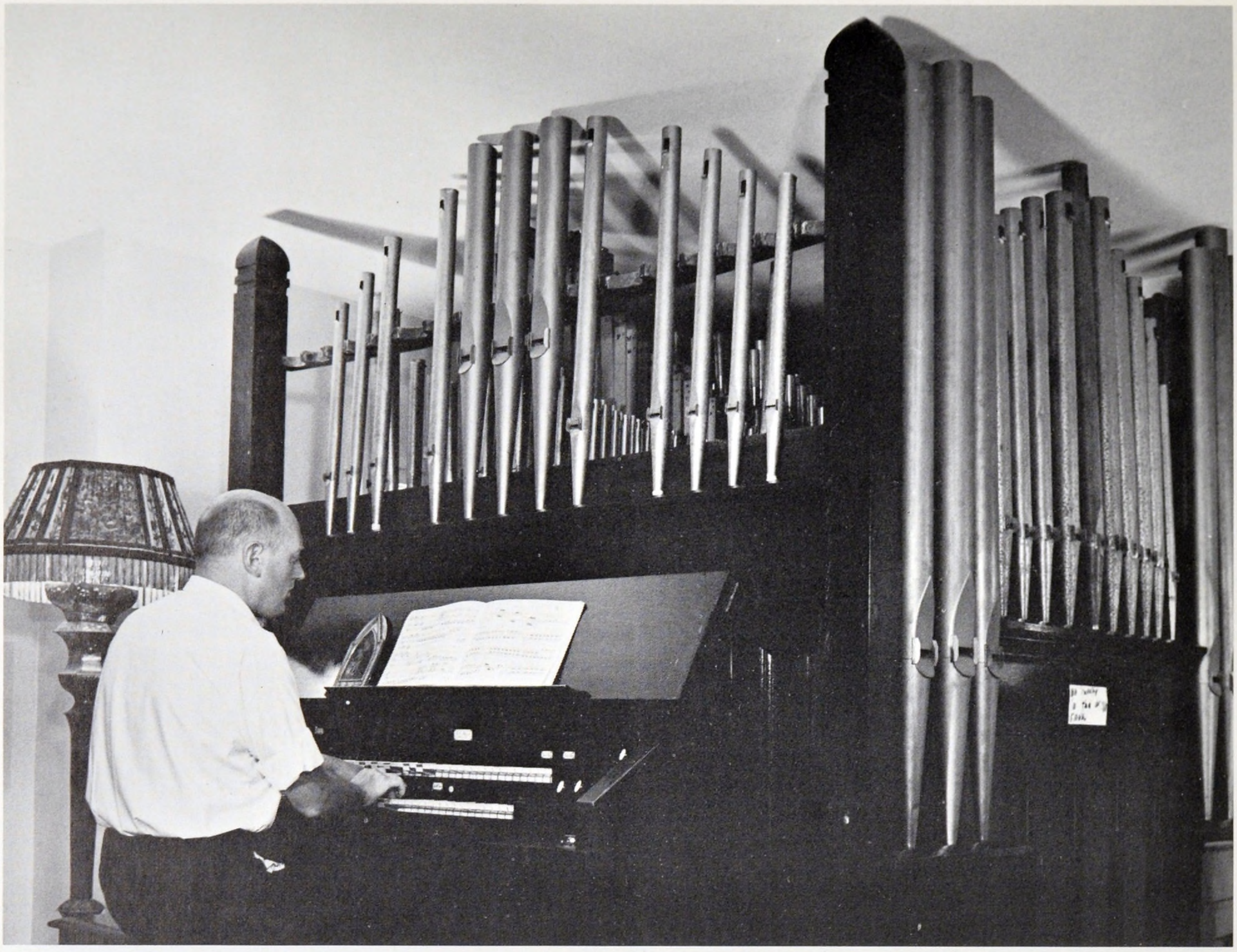
One of the most unlikely aspects of the project, van der Linde reports, was the low cost. His total expenditure, including new and replacement parts was only about $250. A similar organ purchased new would cost about $15,000.

The organ had to be rebuilt substantially to fit inside his house, and it all but fills the Organ Room. Since his ceilings are of normal height, the largest part of the rebuilding involved the longest pipes; he and a carpenter cut off the extra length of the large pipes and mitered them back at right angles to the remaining sections. Since pitch is determined by the pipe's length, and not by direction, it was not affected by the mitering.

Van der Linde's old organ operates on an entirely mechanical basis. It utilizes long strips of wood (trackers) which connect (with a series of levers and moveable parts) the keys to the air release valves under the pipes. When the valves are thus opened, jets of air run through the pipes making them sound.

The organ has eight ranks of pipes (about 450 altogether) ranging in height from several inches to twelve feet, some made of wood, others of tin. The ranks of

Beautifully composed, printed and bound books are the off-hour product of writer Claude Fredericks' press in Pawlet.



Mathematician Reinhould van der Linde's extensively rebuilt old tracker organ fills to the ceiling one room in his home.

pipes are played from two keyboards and from foot-pedal keys.

He has done a great deal of modification and changing of the organ, however, and was not content simply to rebuild. Much of it is totally different, he says. He removed some pipes he did not like or see the necessity for, put some pipes at higher pitches by cutting them shorter (some by as much as one or two octaves), installed a reed rank and other ranks of pipes with characteristics he preferred to the old, and removed the swell mechanism—which makes crescendo available—because he feels it has no use in the classical organ.

He also added high-pitched ranks for additional brilliance and clarity in the ensemble, and built two mutations of existing pipes (cutting a pipe in such a way that it plays an octave and a fifth above the note on the keyboard which activates it). All the changes were made to achieve a "more classical, clear-cut sound."

The only part of the organ operated electronically is the air pump, which is located in the basement of the van der Linde home. Because of the sensitivity of the wooden and metal pipes to temperature and moisture change, all the air for the organ is sucked by the air pump from the room in which the instrument is located.

Van der Linde is a member of the Organ Historical Society, a group interested in preserving old authentic American organs and resisting the addition of electronic devices. He feels the tracker organ is far superior to the more modern pneumatic and electrical organs. "People are beginning to realize that the old tracker organ is really the best," he says. "You get more control, the performer can regulate the speed of attack, it's easier to get a better-voiced pipe, and the sound mixes better with this system. Also, the tracker organ is more reliable, because it is made entirely of working parts, and it is easier to fix if something goes wrong."

"But don't misunderstand my interest in the instrument," he says, "I am passionately interested in organ music. I have always been a pianist, but started playing the organ about five years ago, and I think now that it is a far more interesting instrument to play."

There are others at Bennington too. For example, Robert Woodworth, a biologist, makes time-lapse films of plant life and microscopic organisms; Ben Belitt, a poet, makes documentary films; Josef Wittman, a composer of music for dance, is a photographer; Stanley Edgar Hyman, a literary critic, is also a numismatist; Lionel Nowak, a teacher of music and the College's Director of Development, owns his own aircraft, which he flies for pleasure.

The relevance of the respective pursuits of these men to their teaching is simply: at Bennington teaching is not presumed to be a career distinct from other aspects of a man's life. The quality of amateurism inherent in true liberal education dictates the spirit of teaching at Bennington. The value of these men as teachers is dependent upon their need to create rather than to accumulate scholarliness and, therefore, on their leading full and varied lives of the mind.

The state's rapidly growing Fixed Base Operators now are shipping almost anything

Anywhere by Air

by Alan D. Sophrin

Drawings by George Daly

A Menomonee, Wisconsin automated factory suddenly discovers a noisy bearing in its Vermont-manufactured computer memory drum. A Dallas breeder needs 1000 baby chicks right away. How do you rush a Vermont technician to Wisconsin and get chicks to Texas in a hurry?

You get in touch with a Vermont airport Fixed Base Operator (FBO) and charter an airplane. Air taxi service and other aspects of general private aviation constitute a rapidly growing business, one which is racing to keep up with the state's expanding economy.

Vermont's major fly-for-pay operators offer passenger and freight service on both chartered and scheduled flights, instruction, assorted aerial services and provide repair service and storage for privately owned aircraft. They sell airplanes, aircraft fuel, pilots' supplies and airplane equipment. These FBOs lease airport space and facilities from the airport owner. One leases from a private individual, five from towns or cities and one from the State. The operations range in size and scope from the two-airplane Newport Flying Service, Inc., near the Canadian border to Buker Airways, Inc. in Springfield, which flies a fleet of ten twin engine aircraft led by a 595 mile-per-hour luxury six-passenger twin jet. At Newport, veteran pilot and aircraft mechanic Cecil Wright is the chief and only pilot, flight instructor and mechanic, along with acting as supervisor of the new airport snack bar, which his wife manages. Buker has ten pilots and a total staff of 25.

In the case of the Wisconsin factory emergency, Vermont Research Corporation, a Springfield manufacturer of computer components, received an urgent call on a Tuesday afternoon. Could a Vermont Research technician get right out there and replace the noisy bearing between midnight and 6 a.m.? No other time would do, because the computer was the heartbeat of the plant and to stop it for repairs any other time of day would mean sending the entire work force home. Vermont Research checked all available transportation and found only Buker Airways, located a half mile away, could get a man to Menomonee by midnight. Buker's twin jet took off at 9 p.m. and arrived in plenty of time for the skilled technician to have a midnight snack before he started the delicate task of replacing the bearing. He finished at 3:30 a.m. and shortly after dawn, the jet whispered down its final approach back at Springfield.

"All factors considered," says Hugh Taft, President of Vermont Research, "sending our man out on the Buker jet was the most economical and efficient way to do the job. If the trip had been made any other way, our customer would have had to shut its plant down for a full day and we would have been without one of our most skilled men for three days."

The 1000 baby chicks came from Arbor Acres, Ltd., a farm in Bedford, Quebec. They left Bedford at 4 o'clock in the afternoon and arrived in Dallas early the next morning. They also traveled by jet, but not for the entire trip. They came the first 55 miles to Morrisville, Vermont, in a truck. The next leg was a 235 mile flight to Boston in a low-wing, single engine monoplane. At the controls was ex-U.S. Navy bomber pilot Walter Hoblin, 47, president of Vermont International Airways, the FBO at Morrisville-Stowe Airport. This airport nestles in the shadow of the Green Mountains only six miles from the ski slopes at Stowe.

Hoblin carried the baby chicks on his regular freight run, since every evening at 6 he takes off for Boston carrying freight from northern Vermont and southern Quebec. When his plane is not full of baby chicks, it may be loaded with plastics and electronics products manufactured in Morrisville, Montpelier, Barre, Randolph, and other towns and cities in the area. The monoplane carries up to 1200 pounds of freight or, with the seats in, it carries five passengers plus the pilot (four passengers and two pilots in instru-

ment weather). When Hoblin lands in Boston, he parks beside an outbound airline jet and the freight is transferred. Next to the big jet, his plane looks like one of the baby chicks standing by a mother hen.

The airfield at Morrisville (population 2000) is owned by the State of Vermont, and when Hoblin leased it three years ago, it was an unattended sod strip. Now it has a paved 3000 foot runway (long enough for all light twin engine aircraft), an automatic electronic homing device to guide pilots in bad weather and a new 80 x 120 foot steel hangar. Hoblin is putting in a restaurant and pilot's lounge and plans to acquire a twin engine airplane.

Northern Airways, Inc., at Burlington's Municipal Airport is a striking example of how flying for hire has grown in Vermont. Four years ago, David Carr, now 35 and Northern's chief pilot and general manager, operated from a desk in the airport terminal. He was chief pilot then too—in fact he was the company's only pilot. He had three men working on the flight line refueling airplanes (Northern provides fuel for the two airlines which fly into Burlington) and a secretary to help at the desk (which was shared with a car rental agency). His fleet was two airplanes, a two-place trainer and a five-passenger twin engine for air taxi work.

Today Northern has a staff of 51, and spread out over one end of the airport are its busy repair and radio shops, administrative offices and ground school facilities in buildings and hangars which were empty four years ago. The power tools of carpenters remodeling office and shop space make more noise than the airplanes on the flight line. There are now eight twin-engine airplanes in the fleet, the largest a 14 passenger 250 mile-per-hour turbo jet. Northern also has seven single engine aircraft. Although they can be (and occasionally are) used for air taxis, they are mainly for flight instruction.

All Vermont FBOs teach flying. Vermont Aviation, Inc., based on a well-kept privately owned grass field on the shore of Lake Champlain five miles north of Burlington, has made flight instruction the major part of its business. Chief flight instructor, Hugh Sinclair, 29, explains that this is because Vermont Aviation has developed and advertised a package plan training course which leads to a private pilot's license. It now has 90 students.

Vermont FBOs are qualified to train students who want to make flying a career. Cecil Wright in Newport and Emando Roberti, who as president of Vermont Flying Service, Inc., at Montpelier-Barre Municipal Airport is another one man operator, can both qualify their students for commercial pilots' licenses. Larger FBOs can, besides this, also give training leading to instrument and flight instructor ratings. Northern Airways has a simulated instrument flight trainer. Inside the "cockpit" of the trainer, a student watches a complete set of flight instruments respond to maneuvers he makes as he "flies" and "navigates" the simulator. One of Walter Hoblin's three flight instructors is Miss Joanne Schuler, a former English teacher at Stowe High School who switched to a flying career four years ago.

Buker Airways at Springfield was one of the first air taxi operators in the United States to work out plans with local firms for maintaining and flying company-owned airplanes. Two Springfield plants, Fellows Gear Shaper Co. and Bryant Grinder Co., own executive-type twin engine aircraft based at Springfield's Hartness Municipal Airport. Two New Hampshire firms also have lighter twin engine planes based at Hartness. Under contracts with Buker Airways all four planes are maintained by Buker mechanics and flown by Buker pilots. This gives the owners a dual advantage: pilots are always available—twenty-four hours a day if necessary—and at times when the planes are not flying, the companies do not have idle pilots on their payrolls. When Buker pilots are not busy flying these company-owned planes, they have plenty of air taxi and instruction flying to do in Buker's own ships.

Buker also has a one-year contract with the government for an experimental night jet mail run. The twin jet will pick up airmail every evening at Boston and New York and fly it to Pittsburgh and Cincinnati. The purpose of the run is to find out if such daily inter-city service can be put on a reasonably reliable basis.

Do Vermont air taxis haul skiers? When ski conditions are good to excellent, how many on the slopes come by Vermont-based air taxis? A year ago the answer would have been, not many. The main business the ski slopes created for Vermont FBO's was not in air taxi work, but selling gasoline and tie-down service to skiers flying their own planes here. All Vermont airports are close enough to ski areas to be fairly well crowded with planes when there is snow on the slopes, but until this year skiers who came by air taxi chartered planes "downcountry."

But this year, at least with Northern and Buker Airways, things are different; they are going after the skiers. Both operators are flying scheduled round-trip flights to Boston. Northern is using its 14-passenger turbo jet and Buker is using an old reliable, a 180 mile-per-hour DC-3 which it bought a year ago from military surplus and converted to civilian style. It carries 28 passengers and all their gear.

Veteran pilot Fred Greenwood, 55, the president of Rutland Airways, Inc. at Rutland Municipal Airport, has a diversified business consisting of charter flights, sales, service and instruction. Because of proximity to a federal fish hatchery at Pittsford, Greenwood and his pilots do fish restocking flights over Vermont lakes. Young fish are brought to Rutland in a tank which fits in the rear seat compartment of a four-place single engine plane. The pilot flies about 75 feet above the selected lake and releases the fish through a special fitting in the bottom of the plane.

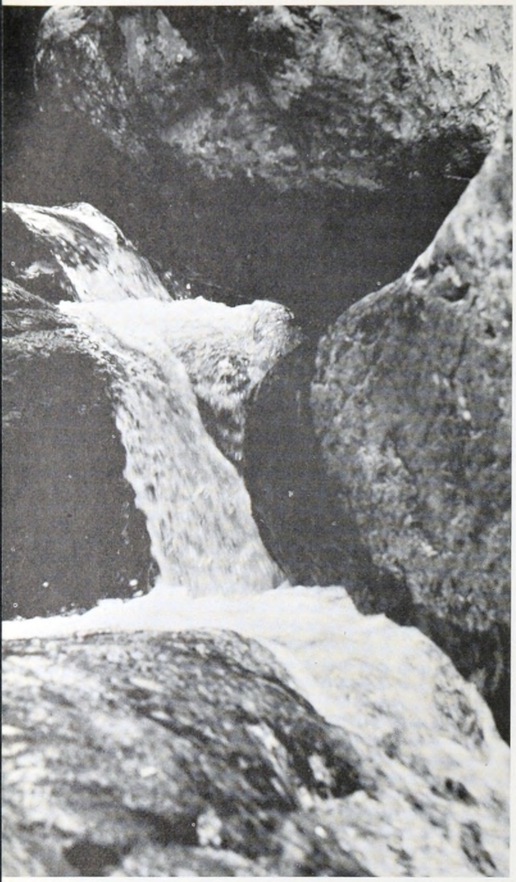
At the Bennington Airport John Meerwarth has a specialized freight service and also provides guaranteed-delivery air taxi connections with scheduled commercial flights to the busy Albany, N.Y. Airport, some 20-minutes flying time away. His flat rate plane charges make the cost per passenger extremely low.

Vermont's FBOs have extensive and diverse flying backgrounds. David Carr of Northern flew for seven years in the Middle East as chief pilot for Cities Service Oil Co. Like Walter Hoblin, Harold Buker, 48, was a military bomber pilot in World War II, but his service was in the Army Air Corps. He was shot down over Europe and spent part of the war in a Nazi prison camp. Hoblin holds the rank of Lt. Commander in the Naval Reserve and Buker is an Air Force Reserve Lt. Colonel. Newport's Cecil Wright and Bennington's John Meerwarth are both ex-farmers. Wright, who is 48, began flying in 1938. He was a U.S. Navy Air Force aircraft mechanic during World War II and afterward maintained a small air strip on the family farm near Newport, until in 1955 the Newport City Council prevailed on him to take over the municipal airport. Before he succumbed to flying, Meerwarth ran a large combination chicken and dairy farm with his brother. Rutland's Fred Greenwood has been flying since 1933. He was a Navy fighter test pilot during World War II, has been an airline instrument instructor and is a former member of the Vermont Aeronautics Board Staff. His son Alan, 24, was taught to fly by his father and now works for Rutland Airways as an air taxi pilot and instructor. Emando Roberti, like Cecil Wright, has been a pilot since 1938. He was an instructor in the U.S. Army Air Corps flight preparatory program in World War II and has run Vermont Flying Service at Barre-Montpelier since 1946.

There are other air field operators in Vermont who do not have air taxis but who keep busy providing a variety of services. Alphonse Quesnel at Middlebury is the only Vermont aviator who does crop dusting and spraying. He uses a World War II vintage open cockpit biplane which is especially well suited to this work because of its maneuverability. His clients include apple orchard owners, the State Department of Forests & Parks, and municipalities which want trees sprayed. Flight instruction is the major activity at Post Mills Airport near Lake Fairlee. Airports at Windsor, Manchester, Enosburg Falls, Basin Harbor, Fair Haven, Island Pond and recently-approved Bondville all have plenty of air traffic, much of it out-of-staters flying to Vermont for vacations. At Swanton, Earl Smith keeps busy repairing aircraft engines and fuselages. At Warren most of the flying is without power, for the Warren Sugarbush Airport is the gliding center of the state. Another airport is proposed for West Dover.

David Carr points out that in Vermont, as in the rest of the United States, the expanding air taxi business can no longer be looked on as just a way for a man who loves flying to make a living. "It's becoming a big business now," he said, "and we're rapidly coming to the point where all of us in the business will have to master modern, big business managerial and marketing techniques." None of the Vermont FBOs would deny that he is right. But like all airmen, they have the look of distance in their eyes and most of them would rather look at the horizon than at a balance sheet. ∽

Vermont's FBOs meet with state aeronautics commissioner Edward F. Knapp, (with bow tie) and his deputy Richard Hurd, (at bottom holding glasses). They are from upper left: Meerwarth, Knapp, Carr, McCone, Hoblin, Roberti and MacDonald. Bottom: Hoyt, Smith, Wright, Hurd and Greenwood.



Few mountain streams
can equal the

Cool World of the Big Branch

by George Benedict Gordon
Photographs by John Harris

I was painting my house on a hot July morning seven years ago when I first heard about the Gorge at Danby. George Bissett, a neighbor, came walking over from next door and stood at the foot of the ladder. There was paint all over me, the flies were getting thicker every minute, and I was ready for the showers. Then George began to tell me about the gorge. He told me how cool and windy the ravine was on a hot day like this. He said he wanted to go back there and cool off. When he told me about the rainbow trout in Big Branch I began to move down the ladder. Minutes later we were off and running at 50 miles an hour from Landgrove toward Danby, twenty miles away across the big ridge.

We followed the Forest Service road along the brook that runs from Mount Tabor through the notch, at 2000 feet, and down the other side of the mountain. At the Long Trail crossing we stopped and parked the car and George took off down the crooked trail that follows Black Brook. I came along after, breathing hard. George is a fast walker, and I was loaded down with waders, rod, creel, net and all the other equipment an angler carries. Ten minutes later we heard the distant sound of falling water, and began the descent into the gorge.

The trail kept on dropping. Soon there were glimpses ahead of bright sunlight and brighter water. A cool wind blew up the valley to meet us. Tall trees shaded the footpath as we came around the last bend into the gorge of the main stream. All the heat of the day was left behind.

Perhaps nothing tells the angler more about a stream than the color of the water. Black Brook, as the name suggests, is colored dark amber by the swamps and little beaver meadows at its source. Big Branch, by the time it reaches its confluence with the brook, is as clear as gin, all color, silt and sand being settled out after miles of running over a clean rock ledge or gravel bottom. Dark water is usually too acid for trout, especially rainbows, which require much "harder" water, with more dissolved calcium in it, than brook trout. So it is with Big Branch, where the relative trickle of dark water disappears in the first deep pool below the inlet of Black Brook. I remember standing there that first morning watching the small waterfalls at the head of that pool. One of them was like a column of glass with white bubbles rising from the rocks at the bottom, five feet below the surface. I made a first cast across to the foot of the falling water.

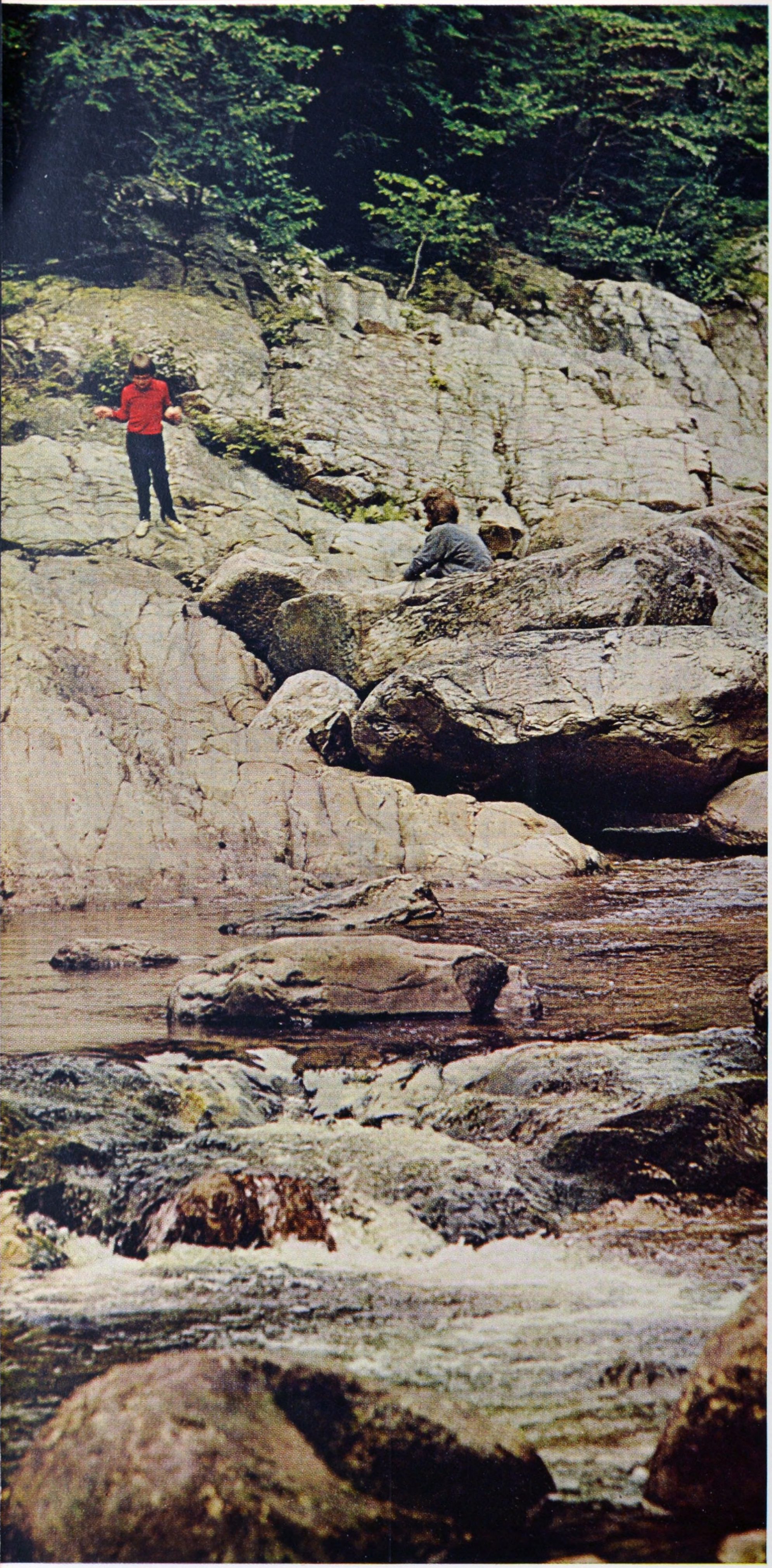
My high-floating dry fly came drifting back from the flurry under the falls. A bright rainbow trout came straight up from the bottom and rose up into the air with the fly in his mouth. I was caught napping, of course, and came back hard with the rod tip, breaking the fine leader in the jaw of the jumping fish. It didn't matter—that place was full of fat rainbows.

For four summers after that first day, I came back at regular intervals throughout the season. Beside the fishing, which was good until the third year of drought (1966) lowered the water to unfishable levels, I found new and interesting things on every trip.

Big Branch comes north from remote Griffith Lake, meets Ten Kiln Brook, and then turns toward Danby to the southwest. At the foot bridge that carries the Long Trail across the Branch, the upper (eastern) end of the gorge begins. From here to the steel bridge where the Forest Service road crosses at the Danby end of the ravine, more than three miles below, the stream pours in a series of waterfalls and pools through piled-up boulders and over hard sandstone ledges.

Some of these boulders are only a few feet in diameter; these are usually round as balls from rolling down over the ledges in the spring floods. Some, on the other hand, are the size of small houses, and these are rounded off only at the corners, where floods bring masses of small stones and gravel carried by boiling currents around the rocks. As a geologist friend of mine puts it, the gorge is a sort of "boulder factory"—one of the few areas where such masses of boulders do not owe their

The author tests a likely trout lair, above, while up-stream, at left, hikers cool off beside the fresh torrent.



origins to the sheets of glacial ice that once covered the Green Mountains, but to the rolling, polishing action of the stream on blocks of quartzite that have fallen from the cliffs above.

Two-hundred yards above the entrance to the ravine, near the steel bridge at the Danby end of the gorge, there is a deep pool, perhaps 25 yards long. Here, under the shadows of the high cliffs, the youngsters from nearby gather on hot afternoons. No more beautiful natural swimming pool can be imagined. A miniature sand beach lies behind a huge boulder where small fry can wade protected from the current.

There was once a good graveled road that wound up through the gorge to the charcoal kilns near the old lumber camp site at Old Job, at the junction of Ten Kiln Brook and Big Branch. During the early 1900s there were five steel and concrete bridges still spanning the stream. Once heavy loads of lumber, bags of charcoal and perhaps wool clips from the sheep farms at the head of the gorge were hauled down the road. But the 1927 flood piled logs and brush and boulders against the rusted steel girders and tore them loose from the concrete abutments. Now the bridges are gone. The timbers of the old logging camp have long since rotted away. Only the residents of one small cabin, used for a few weeks each summer, are left of all who formerly traveled the road.

The trail that follows the road and crosses the rock slides is all that is left of the old roadway. Now only the bear, the deer, the soft-moving bobcat and an occasional angler use that trail. The sound of running water, changing with every summer thunder shower, and the birds' song, which is heard in the gorge even when they have fallen silent in the valley, are echoed back from the cliffs in the clear air. Sometimes, standing in the stream bed, the fisherman will hear voices and laughter as a party of hikers crosses the footbridge on the Long Trail up-stream.

To an angler, of course, the most interesting thing about the place are the trout in the stream. Big Branch is one of less than half a dozen eastern trout streams where "California trout" have established themselves as residents. The only other stream in western Vermont like it which I know of is Furnace Brook.

Rock crags and huge boulders, left, provide a fine scrambling area for surefooted youngsters. Above, opposite, a wide, dark pool invites the author's cast.

About 1886, eyed eggs of the non-migratory McCloud River rainbows were brought from California to Vermont. Some years later (exact dates have been lost) some of these fish were stocked in Otter Creek, of which Big Branch is a tributary. A few small stockings of rainbows were made over the following years, but most of the rainbow trout in the Gorge at Danby are said to be a product of the original stocking in Otter Creek. Most of the waters on the western slope of the Green Mountains are unsuited to rainbow trout according to James MacMartin, aquatic biologist of our Fish and Game Department. In Big Branch, the limestone ledges at the headwaters may account for the survival of the rainbows.

In 1936, Russell Lord, then Superintendant of the Federal Experimental Fish Hatchery at Pittsford, presented a paper at the First National Wild Life Conference at Washington, D.C. In it, he mentioned that Furnace Brook, which flows through the Hatchery, had an established rainbow population—one of the first instances of a wild strain of rainbows living in any eastern stream. I wondered then whether there were not other streams along the west side of the Green Mountains where the same thing might have happened. But I had to wait a quarter of a century to find Big Branch.

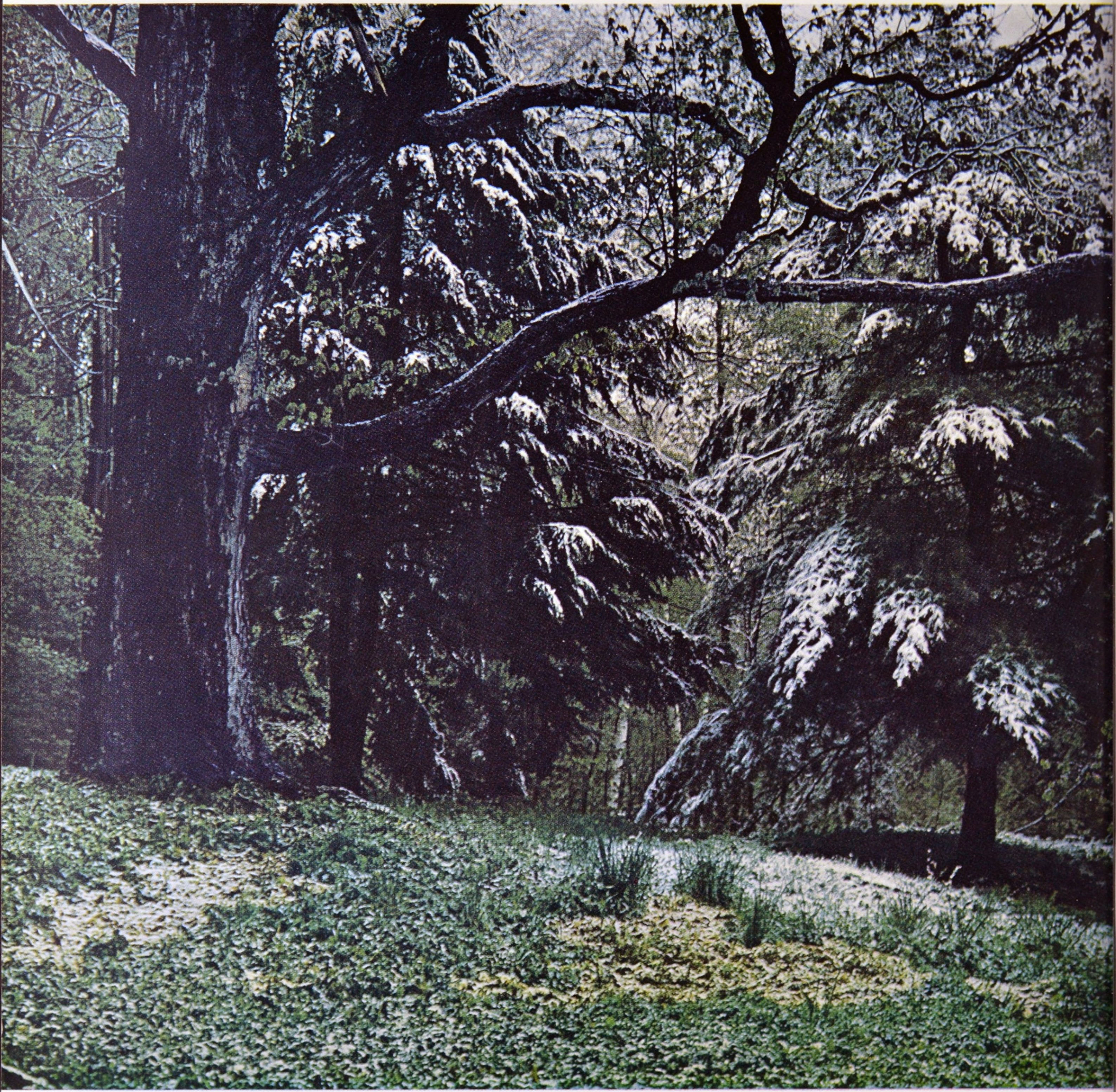
Few fishermen in the east have seen streams like this, where wild rainbows live and take the fly with those high leaps and long fast runs that only the rainbow makes. My first Western trout fishing was done over 40 years ago in the high Sierras of northern California. It is good to be back on rainbow water once again.

Few areas in southern Vermont have higher scenic quality than the valley of Big Branch. Steep, rough, boulder-studded country like this maintains its value for "unorganized" recreation forever, if left alone. As the years pass, some of us may get too old, too short of wind and stiff of limb to climb the boulders and scramble across the rock slides. Perhaps before then the Forest Service will come to the rescue and build a few small cable footbridges across the roaring currents of late spring. Then I will come back into the gorge again!

Even in unspoiled Vermont this is one place you can never forget if you have once seen it: a bit of wilderness, rough, rocky, full of the glint and roar of falling waters, forever beautiful. ꕤ

Restless under the
late winter's snow lies

The Impatient Spring



by Ronald Rood
Illustrations by Robert Candy

Ordinarily our old maple tree is fairly well behaved. Of course it litters our front lawn with twigs and leaves after a heavy storm. Occasionally, too, it threatens our driveway when age becomes too much for one of its tottering limbs. On the whole, however, it's a stately, sedate old specimen. So I was quite unprepared on that February day when it hissed at me.

"Ps-s-s-t!" it said.

Puzzled, I stared at it. Now I could see that something was taking place. I had been conscious of half a dozen chickadees in the tree. However, they were behaving more like woodpeckers; they seemed bent on attacking a huge flake of bark on the trunk. As I watched, more of those strange hissing sounds came from the tree.

Carefully, for I wasn't dressed for wading in the snow, I made my way to the tree. And in the few feet from the driveway to the maple, I walked from Winter into Spring.

The part of the trunk that intrigued the chickadees was broadside to the rays of the morning sun. Although a thermometer in the shade was struggling to stay up in the 'teens, such was not the case with that slab of bark. Its dark color absorbed the sun's rays, and, warmed by the heat from this little wooden stove, hundreds of cluster flies—bane of the fastidious housewife—stirred beneath the bark in their winter bed. Slightly larger than houseflies, they had hidden there last fall as newly formed adults, waiting for the spring mating season. Now, pushing and shoving, they made their way out into the sunshine. Every so often one would buzz its wings briefly. The loose bark, acting as a sounding board, magnified the noise: *ps-s-s-s-t!*

The chickadees, of course, were giving them a welcome. They pecked away at the emerging flies, enjoying this six-legged addition to their routine handout of suet and sunflower seeds. Now and again an ambitious fly would successfully run the gantlet of stabbing beaks and escape into the air. It would instantly be followed by a chickadee, which snapped it up, nosedived, and returned to the tree.

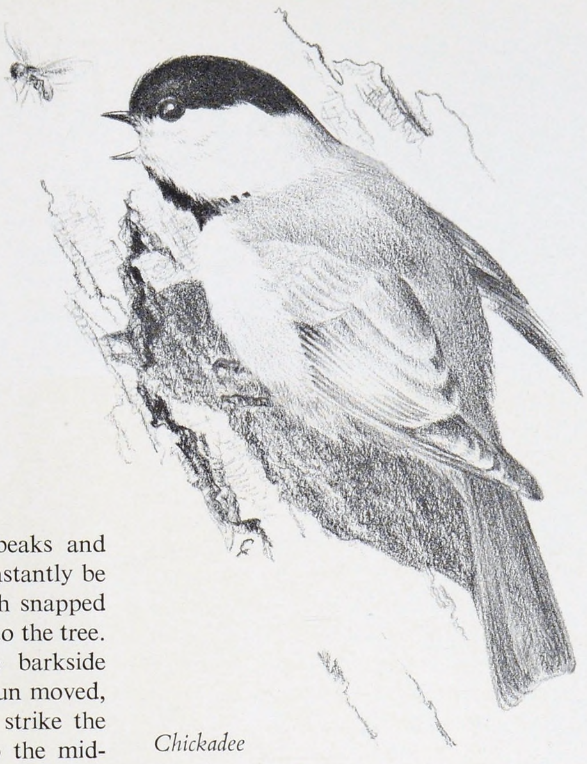
Spring snow, Putney, by Bullaty-Lomeo

For nearly two hours the barkside banquet continued. Then the sun moved, abandoning the tree trunk to strike the thermometer, which soared to the mid-forties. With the coming of shade to cool their home, the flies slipped back into winter. And the chickadees returned to the bird-feeder.

Such little tastes of spring make it hard to say, really, when spring actually *does* begin. The calendar gives one date. The groundhog and his shadow foretell another. Countless little clues like a bunch of flies that cannot wait give still another.

One of the first spring flowers, for instance, may have already been waiting for those same buzzing flies. And "waiting" is just the word, for early spring insects may be vital to its existence. The flower is the peculiar purple-striped cup of the skunk cabbage, first cousin of the jack-in-the-pulpit and of the philodendron on your windowsill.

Sometime in late winter a hidden impulse triggers the skunk cabbage into life. Nothing can yet be seen above ground, but the roots, buried a foot or more beneath the soil along a stream or marsh, begin to convert their stored food into energy. More energy is produced than can be used by the growing skunk cabbage bud: the excess is turned into heat. The heat builds up in this bootstrap operation until the bud lies in the dark in its own little incubator. Melting away the frost with temperatures approaching that of the human body, it forges its way upward.



Chickadee

Having risen aboveground, the skunk cabbage proceeds to demonstrate how it got its name—*Symplocarpus foetidus*, which is merely a scientific way of saying "the plant that smells." Little glands in the tissues produce a powerful odor, supposedly reminiscent of skunk, although to me it's more like a garbage heap. Wafted by the breeze, the odor calls flies, restless beetles, and other insects wakened by the sun. Landing on the pollen-laden center beneath the plant's fleshy hood, they wander around, optimistically searching for the nonexistent trash pile, and in the process they fertilize the curious blossom. Thus it gets a running start on spring while less venturesome flowers are still underground.

The same moist ground that bears skunk cabbages may yield other spring hopefuls. Walk within a hundred feet of almost any brook or stream on a mild winter day. The chances are you may find a creature that insists on living its span backwards—climaxing its life in winter rather than in summer. Creeping over the snow, its slender dark body absorbing heat from the slanting sun, the winter stonefly is nearing the end of its existence. For months it has been a flattened nymph clinging to the bottom as it crawled about in the swift current and fed on other aquatic creatures. Depending on the particular species, it may have had an underwater life of a year or more. Now, instead of waiting for another warm summer, it pokes its way up through the grasses and debris at the river's edge. Although the half-inch creature has wings, it seldom uses them, but prefers to walk—or, if the sun gets hot enough, to run.

Clambering over the snow, it seeks out another of its kind. If it is successful it may mate, lay its eggs along the parent stream, and die before the ice has left its river.

The sun is a heat lamp to many creatures besides the stonefly. On a late winter walk you can find other early risers, too, if you look: spiders that creep over the surface of the snow as if in a dream; little brown caterpillars called from their grass-roots slumbers; wingless crane flies walking on their long legs over the honeycombed snow until you touch them. Then they collapse and fall down between the crystals. You may see gnats that fly in feeble circles until a cold draft hits them and they stall out. Brown miller moths work up enough energy to flit across an opening in the woods; the sugarmaker will call them "sap moths" when they get into his buckets a few weeks later.

You might even be treated to the improbable sight of a butterfly twinkling over the snow. The mourning cloak, decked in heat-absorbent brown, red and blue, with cream-bordered wings, has stirred from its hollow tree. Now it flits to a broken maple twig and samples a drop of sap. As soon as the sun wanes, it goes back to its treehouse.

As the days lengthen, more harbingers appear. The skunk, after a winter punctuated by periods of restlessness, finally decides to call it quits. It can't sleep any longer anyway, for the breeding season is fast approaching. Rousing from its underground den, it pokes around in search of venturesome insects, old apples uncovered by the retreating snow or—opportunist that it is—a member of the opposite sex. As it putters along it blunders into all kinds of hazards, from inexperienced dogs to irate chicken owners. Each blunder is announced on the breeze that flows past my house. However, such is the good-natured attitude with which the skunk greets life that it has probably forgotten the whole affair by the time I get the first sniff.

Mourning Cloak

Gifted with much the same outlook on life, the raccoon also rouses itself to meet spring in advance. You can find its tracks, looking like the prints of baby's feet (hind tracks) plus little hands (front tracks) in the snow. They're somewhat like the trail of the skunk, but the latter often humps along, slightly like a portly measuring-worm. Hence skunk tracks may appear two by two instead of in the more rambling pattern made by the raccoon. Again like the skunk, the 'coon is not fussy about what it eats. Often the first hint you get that the ringtailed little burglar has awakened is the clatter of your garbage-pail cover being knocked off in the dark.

Raccoon

Out in the woods the black bear yawns and stretches. Curled up beneath a ledge or a giant tree root, it has slept fitfully all winter, sustained by its thick layer of fat. Having stuffed its innards with pine needles and other debris, it seems to feel no need for food. Now, as much out of curiosity as anything else, it may rouse itself for a little walk. Then it returns for a few more weeks of slumber, like a man who wakens and resets the alarm clock for forty more winks.

Even the four-footed nibblers—especially the rabbits and deer—get a new lease on life. While the snow was deepest, it covered all of their food except what projected above the surface. Now as the snow settles, new twigs and buds are exposed daily. A walk in an old pasture or half-grown woodlot where young growth is dense will show the fresh marks of the rabbits. The ends of twigs are cut on a slant, for rabbits have to tilt their heads to slice with those buck teeth. The deer, having no uppers in front, must twist their food from the branch, leaving the twigs frayed and splintered.

For the twigs themselves this must represent a sort of double jeopardy. They're exposed the first time in early winter before the snow deepens. Then after it has protected them so well, the snow goes down and leaves them standing there, inviting a passing nip or two as they become available once again.

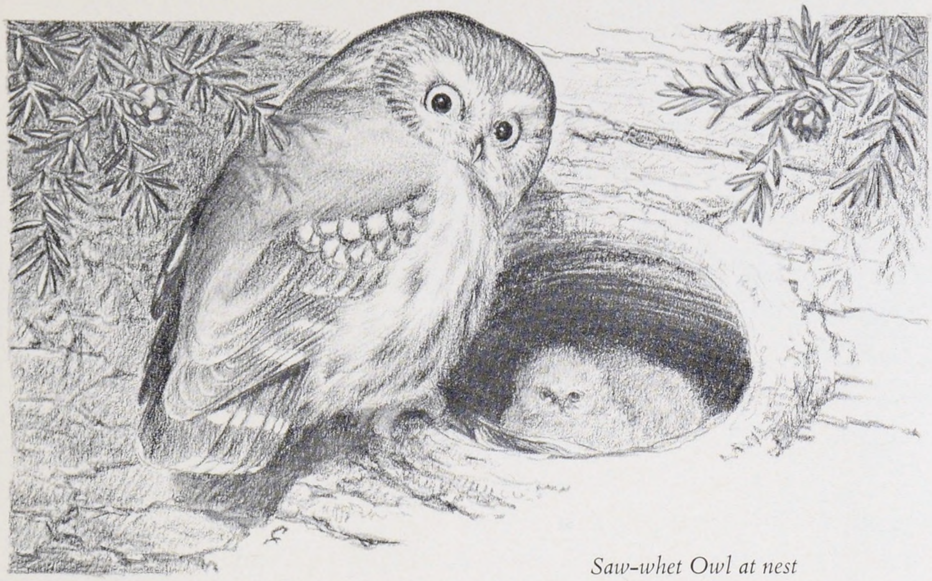
Of course the mice have been busy at ground level, as well. When the snow was heavy, the tracks of a mouse merely looked like a double trail of tiny footprints here and there, emerging from a mouse-sized hole in the snow and burrowing down again. Now the whole traffic pattern of the little rodent is shown: a maze of trails made by tireless small feet. Packed down, these trails stay longer than the softer snow around them. Sometimes they lace the entire landscape, for as many as two hundred mice may populate a single acre of ground.

The first stirrings of spring have a sound of their own, too. Since it is the brink of a new time for seeking a mate, such an important occasion deserves to be announced. As early as February the quiet of my snowy woods may be shattered by the drumming of a woodpecker. This feathered riveter can speak in little more than a squawk, so he advertises his availability in a different manner: finding a hollow tree stub, or even a projecting piece of bark that has just the right resonance, he whacks away. Sometimes I wonder what the reaction must be among the insect population beneath the bark when that din erupts over their heads.

Then, too, there's the spring song of the chickadee. All fall and early winter the black-and-white little waif has said his name over and over as he searched every crack for insects or hammered away at goldenrod galls for the grub that each contains. Now, apparently lifted even more by the lengthening days, his boundless vitality bursts out in a new song. It's a high sweet, two-note whistle. You can copy it almost exactly by whistling the highest note your lips can form for one second. Then drop down two tones and whistle again for one second. Even to the uninitiated, the chickadee's message is clear as the words it seems to say: "spring . . . soon."

People hearing it at first sometimes think it's the call of the phoebe. However, this latter bird doesn't arrive until April. Besides, its note is almost spoken—a positive "fee-bee"—not a clear whistle.

Every bit as meaningful, no doubt, to the ears for which they are intended are the courtship calls of other creatures: the



Saw-whet Owl at nest

moonlight yip of the red fox, the unearthly yowl of the bobcat, the first thumpings of the rabbit as it drums with its hind feet to announce to prospective mates that the time has nearly come to start living up to their reputation.

Sometimes the sounds of spring penetrate even the most well-ordered existence. "Wish you could get over here to listen to this crazy thing," Dana Haskin of Waitsfield told me over the telephone one evening in mid-March. "It goes beep-beep-beep about a hundred times a minute out in a grove of hemlocks. A bunch of us thought it might be some kind of electronic gadget that had come to earth in a parachute. It was loud enough to be heard by a friend through her double-glass windows. But when we went out with flashlights to find it, it took off and lit in another tree. And no parachute would do a thing like that."

We finally decided that it was just another sign of the season—the mechanical wolf whistle of the tiny saw-whet owl. This personable elf, little larger than a robin, nests early, like most of the owls, while humans are still shivering and wondering if winter will ever let up. Owl babies, however, have downy coats of winter underwear to help them stand the cold.

Spring can make itself known even while you're shoveling your walk for the tenth time. Early last winter the predominant color scheme was black-on-white as the bare branches stood out against the snow. Now, suddenly, you realize the colors have softened. The black is not as black. It may have a reddish tinge if you're looking over a valley wooded with maples, a chocolate color with alders, or a yellowish hue where the willows are present.

Individual trees and shrubs are changing color, too. With each little thaw, each lengthening day, new life seeps into countless twigs. Their buds swell to half again their original size, even though they remain tightly shut. The elms growing along the river and hanging over the snowy streets seem to be strung with rusty beads as each bud stands out in silhouette.

If the black isn't as black as it used to be, the white isn't as white, either. Of course much of this is due to the accumulation of the dirt and debris of the winter months. However, it may also be caused by a creature known as the snow flea. This odd insect is about the size and color of a speck of pepper. It acts about as a speck of pepper might, too, if that spicy condiment should come to life. Cocked beneath the abdomen of the snow flea is a taut little spring, bent double and held in place by a trigger. When the trigger is released, the tiny insect is catapulted into the air. Hence another common name, "springtail."

Of course an individual snow flea would not be noticed in all that whiteness. But this wingless little creature with the built-in pogo stick doesn't do things by individuals. On a moderate day in late winter an entire lawn or hillside may be made gray as snow fleas come to the surface in myriads to soak up the sunshine. I've walked up a woodland path during a February thaw and come back along the trail an hour later; each of my footprints in the snow was carpeted by thousands of the tiny creatures. Possibly the compressed snow allowed more light to seep down below, calling them up for a spring frolic.

Although nobody seems to have counted them, springtails must be among the most numerous of all the insects. They can find a living almost anywhere, feeding on algae, lichen, and plant debris. As Mrs. Eleanor Ellis of Springfield wrote to me: "I'm glad they're harmless, or I'd pity the poor stray dog that ever came through our yard!"

There are dozens—hundreds—of other little signs telling us that, even while it looks as if we're in another ice age, Winter is really being pushed aside by Spring. Of course there's the dandelion that chances to blossom on the sunny side of a lawn next to a building in January, or the pussy willow that suffers a whopping case of insomnia and blooms from Thanksgiving to Mother's Day. Things like these get their names in the paper. But the countless little hints of the burgeoning season are there, too, for the looking.

And, much as I love to see the first robin and hear his hopeful chirp in the same old sugar maple that sheltered those cluster flies, there's one thing sure: even though he may be here to get the first worm that dares poke up through the matted grass under that tree, the robin is really no early bird at all. ∽

Skunk tracks

Skunk Cabbage

The Hesitant Awakening

by FRANCES S. LOVELL

Spring comes slowly to the hills of Vermont. It's like a maiden lazy with sleep, loth to rise up and throw off her white blankets. One day the air nips at your heels and chases you into the house; a barrage of snowflakes smothers your breath. The next, a strange tepidness fills the world; water gurgles down the roadsides, snowbanks shrink like ice cream in the sun. Then you wake in the night to the fury of a northeaster batting at the house with icy fists again.

March is the door ajar between two seasons; each day she opens it a little more to spring, and suddenly she flings it wide. April is here, and the furry mittens

Near Tunbridge, by David Plowden

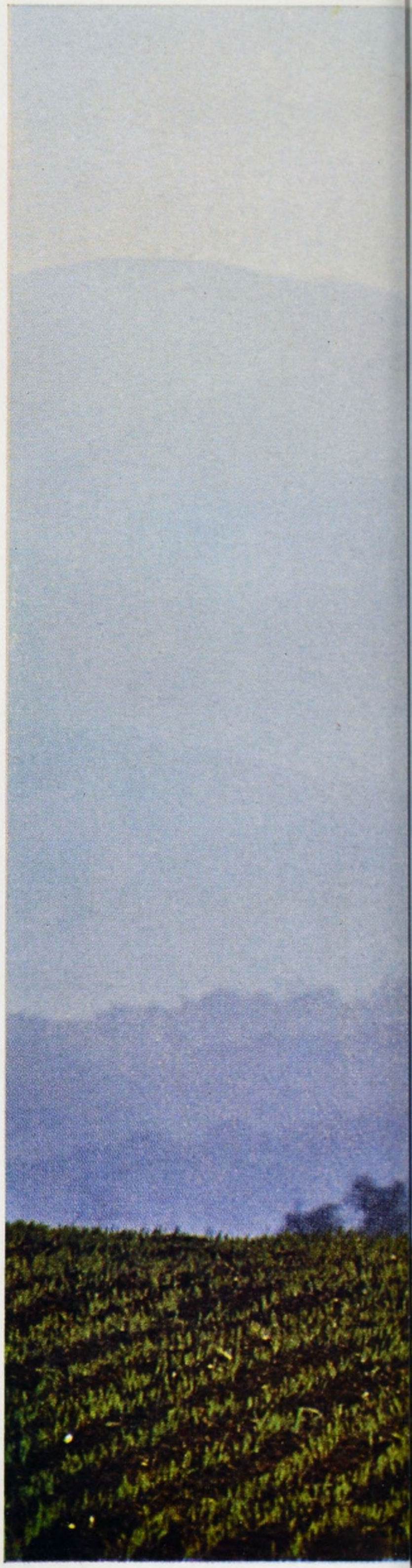
At Bolton, by BULLATY-LOMEO

of the pussy-willows in the swamps have swelled to silken muffs. Each day the soft maples grow a little rosier and the sugar maples more golden, for the sugar house fires have died out for another year. The mad March wind high among the treetops, has blown itself away.

Horses strain once more against their harnesses as the ritual of seed time begins again. But today it is more often the lurching behemoth of a tractor, ungainly on the skyline as it tears the sod. The throb of machines churns the silence of an April day as the long furrows spool out across the land.

The spring brook rushes down the hillside, tossing the winter's debris from its path,

Sugaring, Pleasant Valley,
by CLYDE H. SMITH
Below, new corn near Jay Peak,
by HANS WENDLER



foaming angrily, biting out chunks of banks and ferns as it races toward the river. Even under the hemlocks and spruces, where the cold lies longest, it cracks the last of winter and spends itself in an orgy of song and wild dancing, until it calms in the sunshine of a spring meadow.

Before the last vestiges of snow have gone from the woods, the black sheep of the flower family, skunk cabbage, rears its shell-shaped sheath, pale green, brown or purple. Then in April, along the old wood roads, come the fragrant mats of arbutus, the flower which the Pilgrims called Mayflower. The trillium or wake robin is eagerly sought along cold spring brooks, the red, the white and the little painted stars. The moccasin flowers, which we call ladyslippers, are more like babies in pink sunbonnets under the pines. They're never to be picked, of course, nor the tall yellow slippers in the swamps. A host of little orchids, the lovely showy orchis with its tiny purple and white blooms, the green orchis and the yellow-fringed and a host of others, hide in the secret places of the woods.

One by one the shy blooms of the wildwood appear as the sun strengthens. The madding April brook hushes its clamoring, as if worn out with all its gypsying. Purple, yellow and white violets sprinkle the grass, and the pastel hepaticas cross a rocky ledge. And at the end of March, some early morning, against a cold green sky comes the familiar robin's song, and then the whistle of the bluebird and the whack-whack of the flicker drumming. By mid-April the tree swallows are home again. Their copper breasts and blue backs gleam in the sun as they cut the sky like jet planes. The purple finch plays Lochinvar with dragging wings, strutting like a turkey cock across the lawn to dazzle the shy brown lady of his choice. The phoebe builds her nest over the back door, and it's a wonder the

Above, farm in Shelburne,
by Clyde H. Smith
Top right, Trillium,
by R.D. LaSalle
Right, leafing elm at Bethel,
by Bullaty-Lomeo

Pownal, by CARSTEN W. JOHNSON
Fiddleheads, by R.D. LASALLE

eggs ever hatch, she has to leave so many times a day. But the gladdest day of all is one early dawn in May, when the sky is gold and the old crab apple tree is breaking into fervent pink bloom. It's always on that exact morning when the splash of liquid music comes, telling you that Lord Baltimore has arrived to flash his black and orange uniform among the blossoms.

So the year turns on its slow, inevitable way, and winter gives over to spring and new life breaks abundant on the land. The mystical, rhythmic swing of time and tide moves inexorably on its way. Sometimes I think the lovliest time of life is at this turn of the year, when the earth begins to move toward fulfillment. There is so much of new beauty my heart can hardly stand it. ∞

VL REPORTS

On Coming to Vermont

SAMUEL R. OGDEN

As far as I am concerned to urge anyone to move to the country as the ideal place for retirement is a dubious business both from the point of view of the mover and the place he moves to. Transplanting is an operation that has its dangers as anyone who works with flowers or shrubs knows. I've been setting out little plants all day, taking them out of their secure places in the coldframe, sticking them into the alien ground of the garden where there is no protection, and where certainly some will never take root and thus die.

Analogies can be misleading, so I will pursue this one no further. Suffice it that today was a glorious spring day of hot sun and warm breezes, and of the hundreds of leeks and celeriac plants set out, most will survive. And people will survive transplanting too, but he who undertakes to start his roots in strange soil would be well advised to know all he can about what is involved before he makes the move. This then will be my charge here, not to urge anyone to do it, but to tell them all I know concerning what they might be letting themselves in for.

My excuse for claiming knowledge and wisdom in this highly personal and delicate field? To tell the truth I have none, except that I once lived in the city, and came to the country, and have watched others do the same thing. My own experience was so happy and my friendships among others who have made the good move so wide, that as far as I am concerned it is not an academic subject. I speak not as a professional sociologist, but as one who has experienced what he is talking about rather than one who has merely studied about it.

When I occasionally meet an old acquaintance whom I have not seen for a good many years he is apt to say, "I suppose that you are retired now?" and I have to take care so as not to show that I find the remark slightly offensive. The word "retire" has several more or less distinct meanings, but at the heart of all of them is the idea of withdrawing, of seeking shelter or seclusion, of "taking it easy," of being aimless and without occupation, and I refuse to admit to any such behaviour. In the sorts of things that I do the pattern of my life has been changed somewhat with the passing of years, but I have not been smart or wise enough to have achieved a condition of day to day existence wherein he who lives it is never troubled to do anything he does not want to do, or to do nothing at all if he so chooses.

Near East Arlington, by Bullaty-Lomeo

We once had an old neighbor who said that there were times when she would "sit and think" and there were other times when she "just sat." To be able to do this has its rewards I am sure, for to "just sit" implies a calmness of body and spirit, and a freedom from boredom, which surely are blessings. But there is one great drawback, and that is that there is nothing done, no act of creation performed; to passively accept the passage of time as an accomplishment is something that I cannot do. Time is not my enemy, and there rages in me no lust to kill him. The only compromise that I will make with age is that I welcome sleep, and the greatest blessing of my seventh decade (outside of my wife) is that Sleep and I are good friends, and she seldom turns her back on me when I invoke her presence. Good old girl; she comes willingly requiring no inducements in the form of either pills or rites or incantations.

There is one thing that sets me apart from many of those who will be reading these words, and that is that I am already here and have been living in Vermont in a remote corner of her hills for close to forty years. So, in the change I made from city life to rural life I faced an entirely different set of circumstances from those the person finds himself confronted with now, when at the finish of a long and active career in business or in the professions or as a worker, he is suddenly faced with a great emptiness in life, and with conditions of living to which necessity no longer binds him.

I realize all these things, but have patience and let me ramble on, for perhaps it is just this difference which gives me a vantage point from which to describe the lay of the land, so to speak. For it is strange new territory which confronts those whose deeply rooted habits must be changed, and there are so many different places of departure and so many possible destinations and so many choices of roads to take that he who has been kicked out has a good reason for being bewildered. At any rate let me try to clarify the issues; you will find my desire to help sincere, and that is worth a good bit.

First of all we will discard the words "retired" and "retirement" for I am not speaking to those who seek the life of the oyster. Furthermore, what I have to say is not solely directed to those for whom inflexible rules have left no choice but to seek a different life, but to those as well who want to make a change because of present discontent. Let me make it clear too that the implications of defeat and escape which are sometimes made by the critical arise not from wisdom but from envy. What necessity is there that forces humans to endure a way of life that is unacceptable? To elect to change from unpleasant circumstances to more pleasant ones is to be smart; let no one get away with the implication that in doing this you are a craven who sneaks away from his obligations.

When the time has come to get away from where you are there are lots of possible directions in which to turn; to scenes of childhood, to more pleasant climates, to centers of culture and so on, but which ever way you turn be sure that it is the right way and that you will not regret it later. Once the change has been made it is almost impossible to go back. I have been told that among the saddest people on earth are those who tore out their roots in the east or mid-west only to discover that Southern California is far from being the Paradise they had hoped for, for now they find themselves in an alien land without friends, in a strange setting to which they cannot adjust and with no possibility of return. And this can happen in Vermont just as well as in Los Angeles or St. Petersburg.

Once, a good many years ago, two families of Irish heritage decided to leave the Ozarks where they were established, and move to Vermont. I do not know what glamorous reports they received or how out of all the width and breadth of the United States they landed in this corner of the Green Mountains, but these nice people were here when we arrived back in 1929. In those days there was not much for a farmer to do that would barely keep him alive, and so these people struggled along with their increasing families making increasing demands, but somehow they managed to hang on until after twenty years or so rising real estate values enabled them to sell out and go home. They were fine people, and good neighbors, but they never felt at home here, and now are happy back where they came from.

The ideal prelude to taking up permanent residence in Vermont, to becoming a citizen and a voter in the town of your choice, is to have previously been a summer resident here. For one who has spent many pleasant summer months in Vermont, who knows the people and the countryside, although possibly not the winter climate, the turn to Vermont is a natural one, and there are many such people living here now. The influx of these people has taken place over the last thirty years or so, and now these "sun tanners," as once they were called in scorn, make up a substantial and influential part of Vermont's population. A study of the background of the members of the Vermont Legislature and of people sitting on State boards and working in State agencies, as well as those holding office on the town level, would reveal a surprising number of these Vermonters-by-choice.

You will see what I mean when I tell you that it was as a child visiting Vermont on summer vacations back not long after the turn of the century that I became enamoured of this place. Nowadays more people than ever are becoming acquainted with Vermont, and among these are the hordes of skiers, each one of whom is a potential permanent resident, just waiting for the proper moment so that he may come here to live. In fact the phenomenon of winter sports in Vermont may turn out to be an inhibiting factor, for the influx of skiers has boosted real estate prices possibly out of reach of the pensioner of modest income. But real estate prices vary considerably from one part of Vermont to another, and since it is easy to discover what the going prices are, I suggest that no one turn away until inquiries have been made.

Besides those who can now come to Vermont to live because the pressure of raising a family is gone, and because of liberal retirement and pension plans from which they benefit, there is another class of younger people who have come to Vermont to live. These are the ones who see opportunities which will enable them to live properly and decently here though without much hope of eventual affluence. These are the younger people who have left better paying jobs in other places because the advantages of living in Vermont more than made up for the loss in income. It is in this group that many of the present leading citizens are to be found, from Governor Hoff on down to the young civil engineer who has left a good job in the city to come to Landgrove to live. Here, he is Selectman, Director of the zoning board, and a member of the Bennington County Planning Commission. I know of two families of young 'uns who want to raise their kids here and so have established permanent residences while the head of the family more or less commutes to New York. This, of course is too long a commute except for those who are engaged in occupations which do not nail them down to one spot and require them to keep regular hours. A neighboring town is fortunate in having their community enriched by such a family, and I know of one other further north. Undoubtedly there are others.

Thus far I have spoken of those who have already come to Vermont, and have explained how it happened that they came, but that leaves the greatest part of my task unaccounted for and that is to tell those who are now, or soon will be, planning to get away from their present circumstances what they may be getting in for. To these I say if you have no family or sentimental ties to other places, it would be well to consider Vermont citizenship. I am opposed to high-powered promotion: I can tell you of many good reasons why you should come to Vermont (I am a living example). but the glamorous aspects should not be allowed to outweigh the realities, for there is far too much happiness at stake. Now for the drawbacks:

First of all there is a good chance that you will not like Vermont winters, which are long and rigorous. If you can't take these and can't afford to spend your winters in places where the sun is warm but the prices cool, do not give us another thought, for you will be miserable here. There are lots of summertime Vermonters, people who spend six months or so here, who have chosen Vermont citizenship and who would vote here if they were on hand in March and November, (which they never are), and who the census taker adds to the population of Vermont, but they can afford to have two "pieds a terre," and that is something else again.

Another thing, if you are living on a fixed income in the form of a pension or an annuity, what are the relative advantages of Vermont taxwise over other states? This aspect must be studied; I cannot give the answers here. Then too there is a question of prices, both of commodities and of real estate, but these differences are relatively unimportant.

If you are young and expect to earn your living in Vermont, the above considerations will not daunt you, but young or old, there are a good many things that you had better know about from first-hand experience. This means that you will have to come to Vermont and look around for yourselves. If you have friends here or relatives, you are all set, but if you must start cold turkey, the place to turn to is the Vermont Development Department. Here you will be able to get all sorts of necessary information in the form of a great variety of publications. Write to them at Montpelier, Vermont 05602, and ask for a selection of those which will best suit your requirements.

In addition to the help you can get there, and I have suggested that some competent person within the Department be designated as the specialist in this field, qualified to give the most expert help, be sure to check the Vermont guidebooks. I can think of no better way in which to become acquainted with the physical aspects of Vermont than by studying these. They range from the excellent 80 page paperback published by the Stephen Greene Press of Brattleboro called *The New Vermont Guide* at $1.50 (and your bookseller will get it for you if it is not available), to the big Houghton Mifflin *Vermont*, edited by Ray Bearse, which contains some 450 pages and will set you back $7.95. This of course is the most complete of all and will give many happy hours of touring in Vermont even though you never set foot in the place. In between these two is the New England *Fodor Shell Guide* which includes 47 excellent pages on Vermont, and it may be obtained at Shell service stations for $1.95. Another valuable source of information concerning all aspects of Vermont is the *Vermont Year Book* published annually by the National Survey Company, Chester, Vermont. The price was $7.50 the last I knew.

There is also a book called *Make the Most of Your Retirement: Where to Go, What to Do, How Much It Costs* by Fessenden S. Blanchard. This is published by Doubleday and is for sale at $5.75. As the title indicates it purports to be a handbook of retirement, and while it only devotes seven pages to Vermont, there are so many things of general interest to the prospective retiree that I must recommend it. My only comment here would be to be leery of figures: costs vary so and change so quickly I would think it wise not to dream your dreams around outdated figures.

Things are in such a flux these days that it is absolutely necessary for you to go and see and find out for yourself about all the different places that interest you. Come to Vermont by all means, but do not come blindly, nor with illusions that the first long winter or spell of misfortune would shatter. For a special kind of person Vermont has much to offer. These offerings are not the conventional forms of entertainment, even though television and FM radio can be tuned in at almost any locality. (If you can't live without television, be sure to check.) Of cultural advantages there are more than one would suppose, especially in music, and there are many stimulating communities scattered through the state. But enough of platitudes. I feel about it a good bit the way Dorothy Canfield Fisher felt when she wrote in *Vermont Summer Homes!*

> Superior, interesting families of character, cultivation and good breeding, and also plenty of money need no assurances from anybody as to the warmth of their welcome in any community they may favor with their presence. But superior interesting families of character, cultivation and good breeding with smaller incomes can hardly be blamed if they feel that what they bring to a community is not always appreciated at its full worth. It can't do any harm to emphasize a little the fact that Vermont has special reasons for appreciating how valuable people like you are to your neighbors, and wants to let you know it. Wants furthermore to tell you that some of what are classed as liabilities in conventional prosperous urban surroundings are assets in Vermont.

These words were written some years ago, and were addressed to prospective summer residents, but since then times have changed, and people who in those days would think of Vermont as a place for a summer home, now consider it as a place in which to live permanently. Thus these discriminating remarks by Dorothy Canfield Fisher apply with just as much force and pertinence today. So come to Vermont; we know that if you recognize this place as one in which you can be spiritually at home, you will be appreciated here, and we will make you welcome. But your coming and our welcome must be based on this mutual understanding.∞

River sports are at
their exciting best when
Vermont's valleys are changed

from White Snow to White Water

in the Spring run-off

Story and photographs by Clyde H. Smith

It all begins deep within the mountains—those vast watersheds ladened with winter's accumulation of ice and snow. The rivers awaken from their long hibernation with a roar, and the inevitable process known as the big Spring run-off is underway. Gathering momentum, the swelling waters churn through the valleys heralding the start of that exciting season—white-water canoeing!

Vermont's senior white-water canoeist is Dr. Homer Dodge, active at age eighty.

Commonly thought of as just competitive, this sport is rapidly becoming popular as a form of family recreation. The prime ingredient is Vermont's wealth of beautiful rivers, some of which, though gentle brooks during the summer, offer challenging white-water runs in the Spring. The larger rivers are still navigable much later, thus greatly extending the season.

Some regions have organized canoe groups which schedule weekend trips, taking advantage of river conditions as they become bankfull. One such group, known as the "Canoe Cruisers of Northern Vermont" has explored most of the state's major streams. Often their flotilla will number fifteen or more boats on a river. Made up of family teams—father and son, husband and wife, or individuals paddling alone, the group arranges transportation so that long stretches can be navigated with the assurance of a ride home at the end of the run. Supporting this idea is a back-up team (usually other family members) who shuttle cars back and forth and keep an eye on the voyagers' progress.

Pride of the Canoe Cruisers is Dr. Homer Dodge, president emeritus of Norwich University, who at age 80 is an active participant in all white-water events. Dr. Dodge officiates as senior adviser to the group, and it is through his guidance and inspiration that white-water canoeing has taken tremendous strides as a family recreation. Running the rapids is his specialty, and by carefully studying the river Dr. Dodge is able to maneuver his canoe with utmost precision.

The non-paddler might gasp at the thought of shooting rapids or shudder at the prospect of a sudden upset. Spills are an occupational hazard of this sport, but, for some, part of the excitement is running the thin edge between skillful manipulation or a cold dunking! A good canoeist who can read the river and make its power work for him, is able to enjoy one of the finest of sports. A team working a canoe smoothly through white-water rapids is as refreshing a sight as a horse and rider jumping hurdles.

Safety measures should be considered before entering really difficult rapids. From the river bank, the paddlers can evaluate the situation and plan the strategy for their run. In extreme conditions, a man is stationed on shore with a lifeline so that he can throw the rope to the canoeists if they should capsize. In case of an upset, one should hold on to the up-river end of the canoe to avoid being jammed between a rock and the craft as it plunges downstream. A canoe full of water may equal several tons of force. The boats run the heaviest rapids one at a time to avoid chance of a collision. Attempting dare-devil rides down impossible gorges is foolhardy. Sound judgement and an understanding of the river is the combination that produces a safe trip.

Not all river runs are through wild and woolly rapids. Some of the most pleasant voyages are those which include splices of quiet or slack water with shady pools interspersed with more sporty, lively water. A river with this variety is a magnet for many return visits. Occasionally, a por-

Bill Snyder and son Mark shoot the rapids at New Haven Mills. The river's upper and lower reaches are prime trout waters.

tion too rough to be run will involve a carry or portage. A lightweight boat is a distinct advantage for these necessary detours.

The use of fiberglas construction has opened a new world of possibilities in the many types, sizes and shapes for canoes. Aluminum boats are preferred by some people for their durability. Many feel that the metal resists abrasions from submerged rocks more effectively. The purist might insist on a canvas and wood craft, and he is the envy of all until he experiences a first encounter with those unseen rocks!

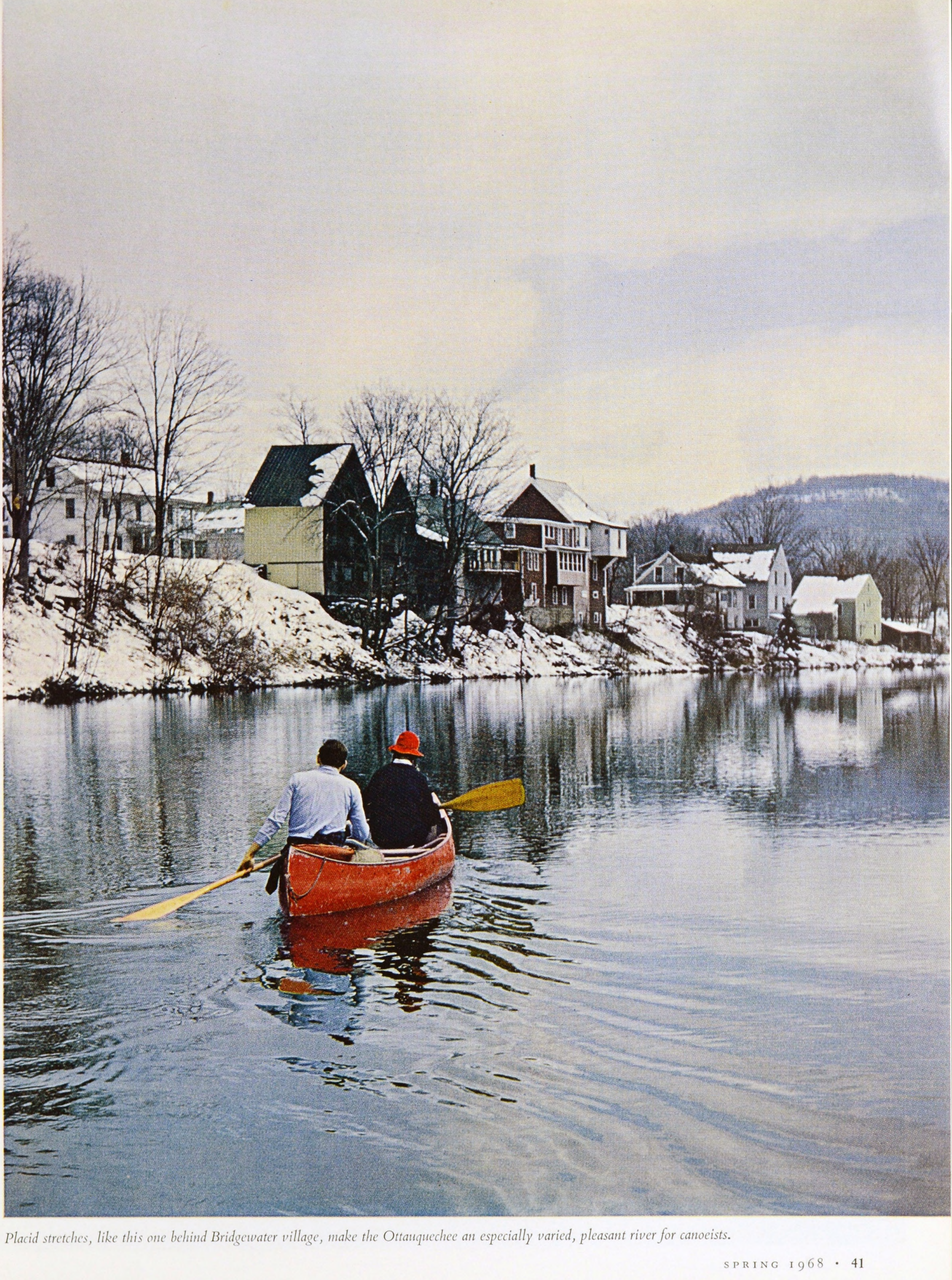
In Vermont, April brings not only showers but the beginning of new adventures in canoeing. Some favorite runs of the "Canoe Cruisers" are those early in the season when the banks are still snow-clad. The New Haven River below Bristol is a rousing run early in the Spring. Lewis Creek in Charlotte, since it is one of the milder trips taken by the group, is usually most popular with the families which paddle. Here the younger children may be introduced to the world of white water. For the more adventuresome members, the challenge of the upper Lamoille above Hardwick offers many miles of churning rapids around huge boulders. Further east near Concord, the Moose River provides a lively section, racing through meadows and evergreen forests. For later trips, the larger rivers like the White, with its broad sweeping turns and portions of heavy rapids, are favored.

Certainly one of the most beautiful of all is the Ottauquechee—even the name is lyrical and flowing. From Bridgewater Corners to Woodstock this crystal ribbon of sparkling water is a real pleasure to cruise upon. Gushing from a deep valley between corrugated mountains, it winds its way among balsam forests, meanders across grassy meadows and finally flows sedately through little villages along its shores. Its accessibility is enhanced by a highway which closely parallels the river, giving the added advantage of more frequent launch points.

Of course, those mentioned are but a taste of the numerous rivers throughout the state. Let these be the sampling to encourage the exploration of others. The canoeist who searches for white water finds it difficult to limit his favorite river to one or even to a few. For rivers, like people, have personalities of their own, and as a result can present different faces with each new meeting. ∽

Canoeist on the Ottauquechee studies the proper line to take through mild rapids above Bridgewater.

Late skiers stream westward on Route 4 toward Killington and Pico as earlybird canoeists head the other way.



Placid stretches, like this one behind Bridgewater village, make the Ottauquechee an especially varied, pleasant river for canoeists.

From the famous old Orvis Company in Manchester, makers of fine fishing gear, comes

aid for ailing anglers

by Jerome B. Robinson
Photographs by Hanson Carroll
Color by Peter Miller

There is a lot of amiable instruction written about how to cast a trout fly properly but most of it is about as helpful as a book on how to swim; when you are in trouble, you can't reach for the manual.

Fly fishermen talk gloriously of perfecting the double-haul cast for distance, the quiet roll cast for touchy presentations and gesture during streamside brag sessions as they relate the intricacies of their casts and the final presentation of an exquisitely tied artificial that lands quietly exactly three feet from the nose of a beaver-sized trout.

When the victor strides off downstream, his monster trout slapping at his knee, less fortunate fishermen creep back into the stream and try to emulate his graceful, casting style. Few ever become expert.

For the truth is that when a golfer buys new clubs or a skier new skis, a multitude of professionals waits to teach him how to get the most from his new equipment. But when a trout fisherman plunks down $150 or more for a fragile bamboo flyrod, he's on his own once he walks out the door. If he never learns to cast properly, nobody seems to care.

Last Spring Vermont's famous old Charles F. Orvis Co., flyrod manufacturers in Manchester since 1856, decided to change that and arranged to offer an inexpensive three-day seminar on fly fishing for the first twenty fishermen to make reservations, be they neophytes or veteran fishermen with casting difficulties.

The Orvis people had cast a magic fly. Within three weeks of the appearance of a tiny advertisement in the company's customer newsletter, 150 people had made reservations, and at Orvis plans were expanded to hold at least five seminars for 30 people at a time. By the end of the summer nine seminars had been held and 235 fishermen and women had come to Manchester for instruction in fly casting, choosing tapered lines, knot tying, fly selection, and actual fishing in the Orvis casting pond and on the trouty Battenkill.

Graduates of the Orvis instruction may work out in the afternoons on the peerless Battenkill, at left, reputed home of especially educated breeds of native and brown trout.
The scene of awful confusion, shown above at the Company's casting pool, bears testimony of the flycasters' gathering skill and concentration.
High-density fishing of this sort is found on Vermont streams only during children's fishing contests.

They came from as far as California, Texas and Florida. Some were experienced fishermen, many were beginners, and some were fishermen's wives. Some brought their own equipment, but most took up Orvis president Leigh Perkins's offer to use anything the company had in the store.

At the opening sessions the lines in the air looked like handfuls of thrown spaghetti, but with instruction from the Orvis staff, casting ability improved rapidly and by the end of the three day seminars student casters were picking targets among floating leaves across the pond.

In the afternoons groups were supplied with barbless flies and practiced hooking trout in the stocked pond. In the evening they often fished the nearby Battenkill.

There was instruction for everyone. Beginners were taught effective arm and wrist action and learned to let the flyrod do the work. More experienced fishermen came to learn distance casting and strove for more grace and accuracy. There was even one fellow who could cast well enough but said he had a special problem. "I want to learn to cast under a bridge," he said. "I like fishing under bridges."

Fishermen agree that there are only two kinds of people; those who fish and those who don't. For some of those who do fish the Orvis Fly Fishing School was a unique opportunity to learn to fish well with fine equipment and to borrow a measure of the Vermont serenity while they were here. ∞

Learning flycasters, using barbless hooks, actually are well spaced out around the Company's large and well-stocked pool, below. The speckled beauty shown below opposite is larger than most will land here. Attaching a dropper fly to the fine leader is demonstrated at right by one of the Orvis instructors.

Beneath its green coverlet Vermont is an ancient, much rumpled bed with many blankets of rocks and sediments. Its geology reveals

Vermont's billion-year past

and provides a glimpse into the future.

by Barbara Blau Chamberlain

Illustrated by Frank Thorne

"We entered the lake, which is of great extent," wrote Samuel Champlain in 1609; "I saw some very high mountains on the east side." In that view of the Green Mountains, how much more he actually saw, from the standpoint of a geologist!

He saw part of a rocky wall, 150 miles long, a feature which had dominated the landscape for more than 200 million years. On the rocks of its face, more than twice that old, he saw the sun glint from the floor of a vanished sea which he took to be snow; and in the foreground of his view he saw a forested stretch that was once the floor of a far more recent sea.

In those "very high mountains" he saw the 4000-foot remnants of mountains once higher than the Alps, mighty monuments to long-ago convulsions of the earth's crust. He saw in them the stepping stones of a moving ice sheet which completely smothered them even while prehistoric men already were inhabiting his native land. Indeed, vast new dimensions of discovery, geologically speaking, lay locked in those mountains.

With geology as a tool, you have only to scratch the surface of Vermont and you become a discoverer. In Vermont you see some of the most ancient rocks on earth, and some of the youngest lakes. You can collect fossil sea shells and chunks of prehistoric coral reefs. You can find garnets and pure copper. You can pan some of Vermont's brooks for gold and find it, perhaps almost enough to pay for your pan. It may be that you like to collect scenic beauty on film or in memory, and even this involves geology.

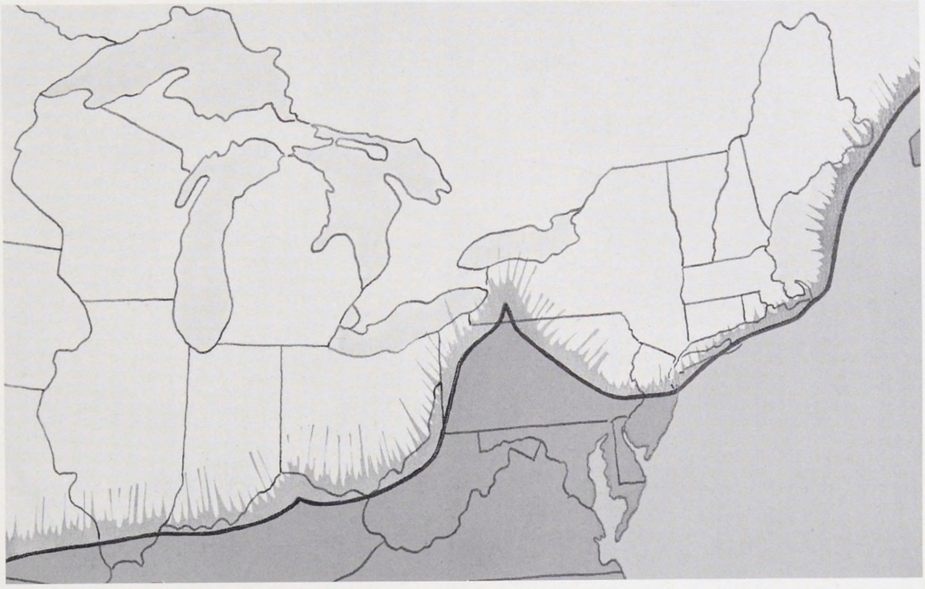
Geologic forces are Vermont's landscape shapers, mountain makers, the creators and destroyers of her bedrock framework. Some are always with us and include rivers, rains, sun, frost, winds and living creatures. Others, like ancient earthquakes and overwhelming glaciers, are long vanished. But the Vermont we see today is the product of all these things.

Beneath its green coverlet, Vermont is a hard, much-rumpled bed. It is piled with blankets of rock and sediment, wrinkled into folds which run north-south. It is a thick bed; some individual blankets are thousands of feet thick. Most are now solid rock, but many began as the mud and organic ooze of sea floors, so long ago that even the Green Mountains did not yet exist.

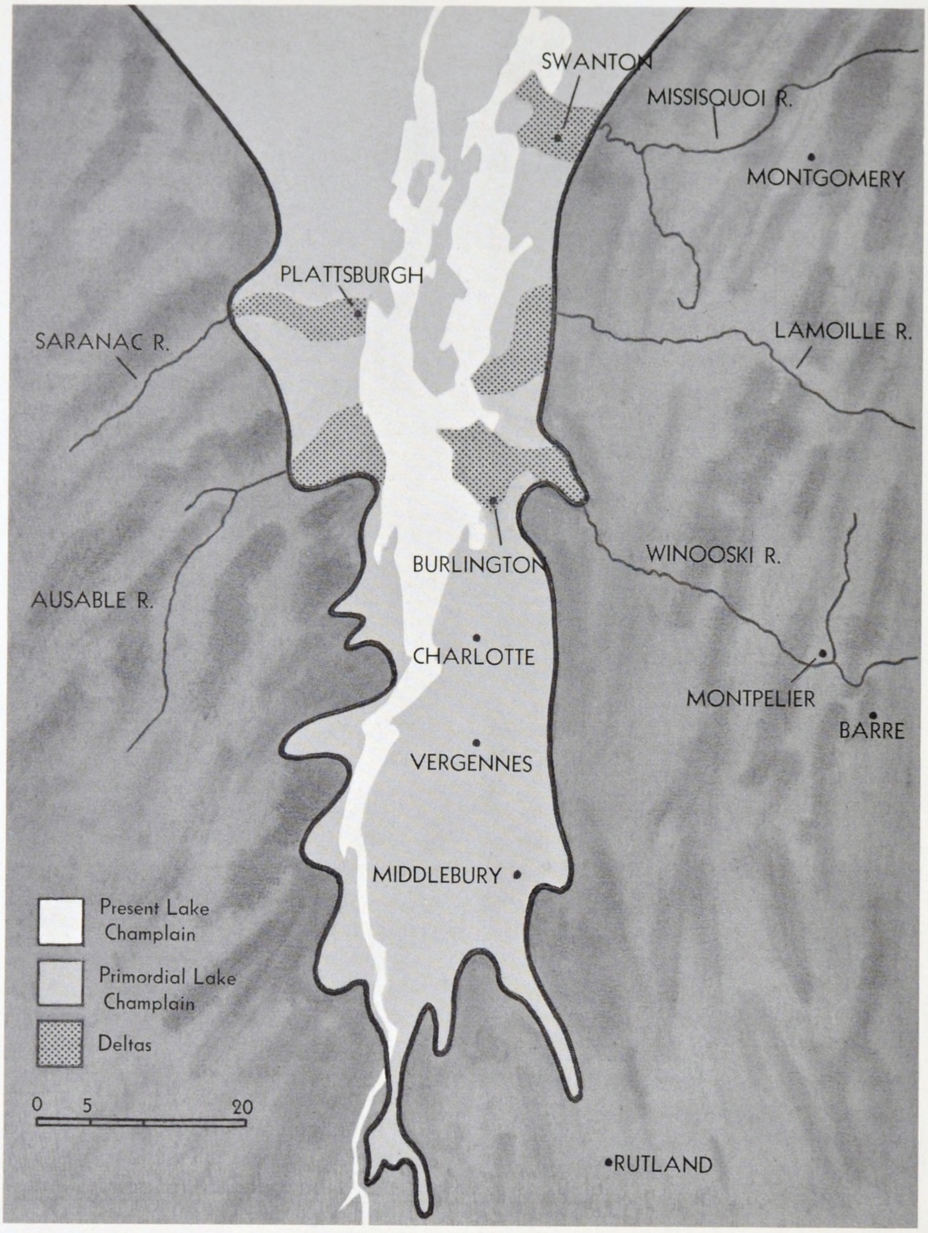
If we could make the rumpled bed properly smooth again, we should find that the lowest blankets are the oldest and date far back to the earth's remote infancy. In most places these are topped by a thick pile of more recent blankets from the earth's early youth, still so long ago that all life remained in the seas. The record of the long eons of the earth's maturing and of evolving land life are hardly represented in Vermont. For right across these early blankets lies the coverlet, haphazardly draped over the state by glaciers of the ice age, known to geologists as the Pleistocene Epoch.

This coverlet, unlike Vermont's earlier layers, has not yet had time to become solid rock. The fantastic era of the glaciers began only a few hundred thousand years ago and ended only 10,000 years ago. Vermont newspapers often carry wintertime stories recalling 1816, the harsh year without a summer. But during the ice age, Vermont was summerless for thousands of years. Such finds as a mastodon tusk and a mammoth tooth, turned up in Vermont glacial debris, tell us that huge arctic mammals roamed Vermont along the glacier's fringes.

Vermont's glacier came oozing down like monstrous dough from thick Labrador snowfields. When it crossed the Canadian border, it rose certainly a mile high, perhaps nearly two. Could you have stood on Mt. Mansfield while the ice crept toward it, you would have looked *up* at an ice slope rising at least 1000 feet above you, backed by solid ice for hundreds of miles. During the height of the ice age, Vermont—mountain ranges and all—simply vanished from the face of the earth.



Vermont vanished from the Earth for thousands of years, buried perhaps two miles deep by huge, moving glaciers. Approaching ice wall, at left, towered high above Mansfield.



Lake Champlain today is only a small vestige of its former size (shown in light gray area here). Thousands of years ago the Lake was swollen by waters from the melting glacier. Then, as the ice melted further northward the salt ocean waters rushed in from the north forming the short-lived Champlain Sea. The gravel deltas which the rivers built into this vast lake, became dry plains when finally the water level dropped and the depressed land rose. Part of Burlington stands on one.

Before the ice retreated and left its debris draped across Vermont, it scoured and stripped the summits of age-old soils and huge chunks of bedrock. It shaped ancient river gorges into giant U-shaped valleys, such as Coventry's Black River Valley. It gouged the great trough which cradles Lake Willoughby between Mts. Hor and Pisgah. It snagged an enormous chunk from the southern end of Camel's Hump, leaving the 500-foot rocky wall we see there today. Meanwhile, its meltwaters and piles of debris detoured the river waters enough to carve the Williamstown, Northfield and Granville Gulfs.

Captured rock ledges worked their way through the glacial mill, churning into boulders, pebbles and clay. Studded with such rocks, the glacier's base became a giant rasp. It tore grooves and scratches into the bedrock of all Vermont's mountains, sometimes gouging a foot wide and inches deep. Mt. Mansfield's scratches are generally smaller, and quite abundant. We can plot the general direction of all Vermont glacial scratches and find that Vermont's glacier was enroute to eastern Massachusetts and Long Island; indeed Cape Cod and Long Island are built partly of Vermont's stolen substance.

Everything caught up in the glacier had to be dropped again, and all manner of rocky debris marks its wake. Such hodgepodge glacial material is called "till." Some of northeastern Vermont is so thickly blanketed with till that little bedrock shows through.

Many of the glacial rocks are small, the special province of wall makers and menders. Others, termed "erratics," are huge stones of many tons, such as the 3400-ton Whitingham boulder named "The Green Mountain Giant." There were enough glacial erratics in one Irasburg hill during the last century, it was said, "to build a city as large as Boston."

Some of the boulders you see strewn across a Vermont field may lie hundreds of miles from their original domains, others next door. One peculiar glacial rock on Mt. Mansfield originated at least 120 miles away. A boulder which originated in Canada was moved years ago from a Stowe road to serve as a cemetery marker: "It had better have been left where it was," said one Vermont geologist, "as a true memorial of the ice ages."

Such Vermont erratics can be striking. But they are exceeded in sheer tonnage, and in commercial value, by the more humble clay, gravel and sand of the glacial load. From Canada came countless tons of soil. Clay settled in glacial ponds across Essex, later to become bricks for many Vermont buildings. Glacial clay, too, went into early Bennington potteries and some of Brandon's firebricks, and there are huge clay deposits lining the Connecticut River.

Glacial gravel hills are abundant and often bear the open wounds of gravel pits. They were built by pebble-laden meltwaters. Some poured down the ice front and left conical gravel hills, called "kames," such as Middlebury's Chipman Hill. Others flowed in tunnels beneath the ice and left ridges called "eskers," such as the one that stretches twenty-four miles from Windsor across the Connecticut River and into New Hampshire. Other gravels simply lie spread in vast plains, like those which provide Burlington with its airport and Centennial Field.

After the ice vanished, it continued to bestow gifts on Vermont. For glacial materials left the natural drainage disorganized, and ponds appeared across the landscape. Many have vanished. But many more remain—large lakes such as Willoughby, Dunmore and Bomoseen, and a host of little ones. These are so abundantly sprinkled across northeastern Vermont that Woodbury alone has 32. No Alpine lakes are lovelier than Vermont's, according to travelers who have seen both.

But the glacier's masterpiece is Lake Champlain. The Champlain Valley already existed long before, as a sunken section of the earth's crust. However, it was the waning glacier that created the lake. Having overpowered everything that it had encountered, the ice finally met the one thing that could overcome it—the slow return of summer to the earth. Against the gentle attack of warming breezes it slowly withdrew and, melting, released torrential meltwater streams.

Lake Champlain drew its early sustenance from such streams. At first it filled only a preglacial river channel which still marks its deepest part and defines the New York-Vermont boundary. Then, as the ice continued to melt, the lake grew far larger than it is today, spilling over the entire Champlain lowland. Much of northwestern Vermont came to lie beneath its swelling waters, which finally lapped the flanks both of the Adirondacks and the Green Mountains. Hills in the valley today, such as Charlotte's Mt. Philo, rose as islands above the great glacial lake, and waves carved terraces into their sides. On Mt. Philo's face you can easily spot such terraces still, showing successive water levels of that older, larger lake.

At that time, northwest Vermont's rivers had shorter journeys, since the shores of the swollen lake lay far to the east. They picked up detritus along their routes and with it built vast triangular gravel deposits, or deltas, into the ancient lake, just as they are building new deposits into the present lake. Today those original deltas are abandoned and dry. Part of Burlington stands on the Winooski's ancient delta, Bristol on one of the New Haven River. From the Lamoille's old delta, lake currents have snatched sands to build the bar of Sand Bar Bridge.

As these deltas were growing, the ice was receding, the lake shrinking. In time, the glacial front had withdrawn far into Canada. Now salt waters from the Gulf of St. Lawrence, no longer blocked by ice, could find their way freely into Lake Champlain. Thus was born the shallow Champlain Sea, and for a brief time Vermont had a sea coast.

But the Champlain Sea was not to last. It came to an end with an uplift of the earth's crust, released from the ponderous weight of the ice. At the height of the glaciation, the bedrock had sunk hundreds of feet; in fact, Canadian bedrock, beneath the thickest ice, was depressed nearly half a mile. When the ice retreated, this rock was rid of its heavy load. The land began to rise sluggishly but measureably. It cut off the Gulf so that Lake Champlain freshened again, and it is rising still.

The Champlain Sea, during its short life, was larger than today's Lake Champlain. It stretched north as far as Montreal. But it never reached the huge size of its forerunner, Glacial Lake Champlain. Probably Hinesburg and Middlebury were seaside lands, showered by salty sea breakers. Beaches spread out at the foot of these higher lands, waves lapped the old river deltas and carved terraces into them. Meanwhile, rivers continued to build deltas, but these new deposits were lower, formed in the shallower waters of the sea. Today the flat plains east of Burlington, including Fort Ethan Allen, are only remnants of a wide delta built by the Winooski River at that time.

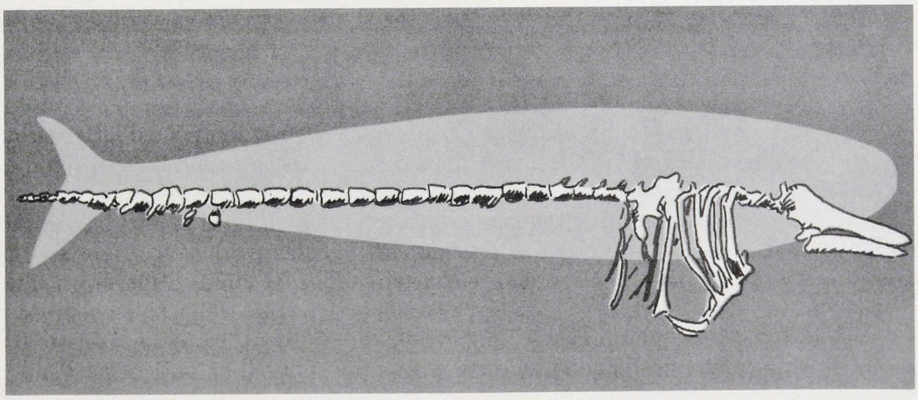
Wintertimes now, ice shanties dot the frigid surface of Lake Champlain, inhabited by fishermen after smelt. These fish, along with Lake Champlain's dogfish and gar pike, are saltwater holdovers which adapted themselves as the lake freshened, living relics from a briny past.

There are non-living relics too. Whales swam in the waters and left one skeleton in Charlotte, another in Cornwall clay. The floor of the sea held a large population of coldwater shellfish such as clams, mussels and oysters; you can see them today, as fossils, in clay banks along the present lake. (You may find "buttonmolds" too, not fossils these, but limy discs deposited around plant stems or other nuclei that have decayed, leaving hollow centers). Real fossil shells are common, and not confined to lakeside areas. They lie beneath Burlington's asphalt, and a few miles north they have been found 300 feet above today's lake. The Champlain Sea was not really 300 feet deeper than the present lake there; rising of the land since the ice left simply has been greater, the farther north we go.

Across the mountains, to the east, meanwhile, the Connecticut River Valley was feeling the effects of the glacier too. Unlike the Champlain Valley, that of the Connecticut River slopes southward. Consequently no ice-dammed lakes developed in it for any length of time. But the glacier had lain as heavily on the Connecticut Valley as on the Champlain Valley, causing its bedrock also to sink. Thus it was that when the melting ice withdrew northward along the Connecticut Valley, sea level waters from Long Island Sound followed it, creeping northward along eastern Vermont in a narrow inlet to near St. Johnsbury.

The Champlain Valley's abundance of fossil souvenirs from its maritime past is lacking in the narrower Connecticut Valley. Icy meltwaters continually flooded down from the north, chilling the salt waters and diluting them with fresh. Seashells and other marine life apparently were unable to breach such environmental barriers and to set up residence in the long, narrow inlet.

Between these two great boundary valleys of Vermont, the ice played havoc with



The Whale that Swam Over Charlotte

This whale swam in the salt sea that invaded the western Champlain Valley thousands of years ago. Clay in Charlotte yielded the skeleton in 1849, inspiring Miss Julia Pepper, of Montpelier, to write this delightfully misspelled "Observation to a Whail."

". . . P'r'aps you's ridin' on an Ice Burg . . .
Or may be
You considered Lake Shamplane
Was the Pacific Oshun! . . . Ain't
You took in? Mounted on
Paddles how's you expect to travil
I sh'd like to know, on the clay
Called Plisterseen? . . ."

subsidiary drainage. Rivers turned into ice-dammed lakes; these appeared, coalesced, separated, vanished again. As the ice shifted its weight across the land, the drainage of these lakes shifted from one direction to another.

Each of the great rivers now flowing into Lake Champlain, such as the Winooski and the Lamoille, were for a time simply marginal glacial lakes, squeezed between the ice front and the mountain divide. Sometimes they were forced to spill over the divide and drain eastward. Sometimes they merged, as in the short-lived Lake Mansfield, east of the mountain.

Later, as the water levels dropped, they split again. It seems likely that for a time the Lamoille joined the Winooski to become part of the Connecticut River drainage, finding their way into the Connecticut by way of the White River. It was only after the ice had thoroughly cleared out of the Champlain Valley that these displaced rivers could about-face again and, like returning refugees, establish once more their ancient routines.

From Vermont's relatively recent icy past to her remote early infancy is a soaring backward leap through perhaps a billion years, for some of the bedrock directly beneath Vermont's till is among earth's oldest rock. But on Vermont's mountains there are places where, with a single step from till to bedrock, you can bestride the ages. Against the unimaginably long existence of that bedrock, the glacial tides, the invasion and exclusion again of the Champlain Sea, all were as a wave which rushes onto shore, leaves an imprint, and is gone.

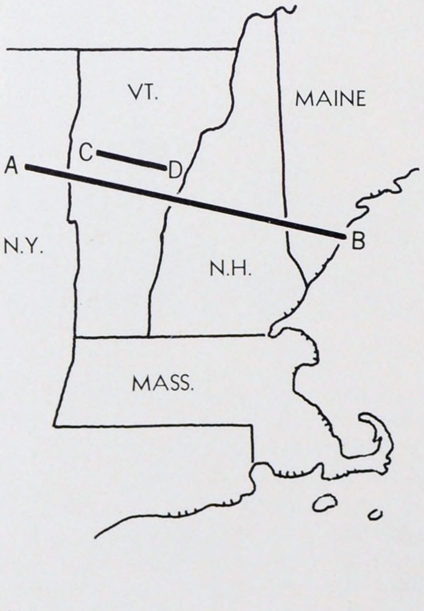
Hikers who follow the Long Trail along the southern Green Mountain crest sometimes tread on ledges of granular quartzite, banded gneiss and schist. No longer recognizable are the muddy sea floors, sandy beaches and scattered volcanic lavas and ashes that were their origins. These ledges formed during the remote era known to geologists as pre-Cambrian, the earliest era of all. At that time there were no Green Mountains. Shallow seas inundated Vermont, again and again. On their floors, in time, settled thousands of feet of sand and limy mud. Eventually raised up and exposed to air and to solutions bearing natural cements, these became sandstone, shale and limestone. Millions of years of earth disturbances, accompanied by heat and pressures, transformed these into metamorphic rocks.

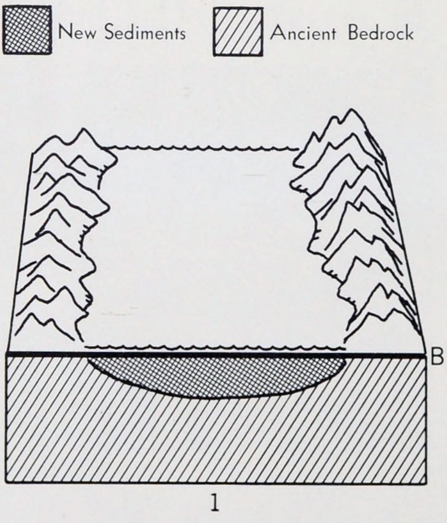
Pre-Cambrian Vermont was a harsh and alien land. In that early morning of the earth, only rivers and wind-blown sands moved on a landscape unsoftened by greenery. The seas held only the simplest organisms. Precious few fossils have come to us from pre-Cambrian rocks anywhere, and none fully verified from Vermont.

All of Vermont rests on a pre-Cambrian foundation, but much of it lies deeply buried. In the northern Green Mountains, younger rocks cover it. When the loose sediments of these younger rocks began to accumulate, during the so-called Paleozoic Era, the sea still harbored all life. But no longer was that life utterly primitive, and pioneering fishes began to appear. For much of the time, not only Vermont but the entire eastern United States was under water, and in that water, life abounded. Many of Vermont's early Paleozoic rocks to the west of the Green Mountains abound with sea fossils. Those east of the mountains once did, too, but the pressures of mountain building have destroyed them.

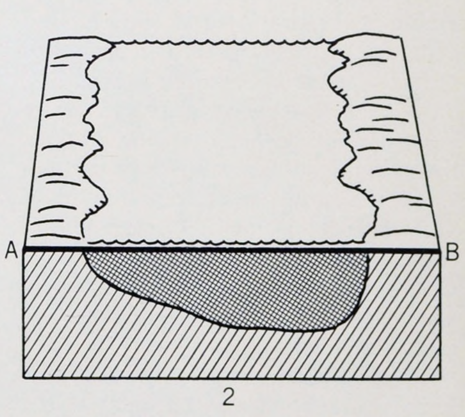
When these animals lived, the Green Mountains still did not exist. As now, the still older Adirondack land mass lay to the west. To the east stretched a mountain range along New England's present sea coast. Seas spread between these highlands. Down the mountainsides poured eroding rivers, dropping their silty cargoes as they entered the seas. The substance of the wasting mountains spread across the sinking sea floors.

When Vermont's share of this sediment blanket was nearly 10 miles thick, the sea fell back for what would be the final time before the brief ice-age Champlain Sea. Along the entire eastern United States the earth stirred, rested, then, some quarter billion years ago, stirred again. Forces pushed from the east, slowly but with mighty consequences; the crust crumpled, the bedrock folded. Up rose the pre-Cambrian and Paleozoic sediments into a mighty arched ridge. All along the eastern United States the mountain ranges rose—Blue Ridge and Appalachians, Berkshires, White and Green Mountains. The western face of the Green Mountains marks an enormous fault, or breakage plane, in the rock, where pressure thrust the eastern segment into the western.





New England, 500 million years ago, had mountains along today's seacoast—and a sea from which the future Green Mountains would rise.



1. & 2. Erosion slowly wore the mountains down. Their substance spread and thickened on the sinking sea floor. The next three sketches are closeups of a small part of the sea floor shown in the sketches on this page.

If the Green Mountains are impressive now, they would have been awe-inspiring at first. Today they show the lovely, rounded contours of age; jagged peaks were features of their long-gone youth. Although some two dozen of their peaks still rise more than two-thirds of a mile, they have lost thousands of feet of their original crest to long erosion. For they already were ancient when dinosaurs walked, and to the Green Mountains, the mighty Himalayas are mere infants of 40 million years.

Since the mountain-building forces came from the east, their effects diminish west of the mountains, so much so that western rocks are only slightly wrinkled and yield a rich fossil harvest. But in the mountains and eastward, Vermont received new rocks for old. Heat and pressure metamorphosed these rocks, so that shales became gneiss and schist, limestone became marble, and sandstone became quartzite. Although the upheaval destroyed the delicate fossils of these rocks, it studded them instead with minerals—a happy event for today's rockhounds.

To name a very few, there are red garnets an inch across, rare tiny green garnets, tourmalines and chrome ore, magnetic iron ore and shiny cubes of fools' gold. Vermont has true gold too, but no gold rush is likely to result. From its quartz matrix it washes into streams, and its flaky, golden leaves sometimes get caught by natural riffles in the stream beds. Once it was somewhat profitable, but now, in the words of one spoilsport geologist, it is "hardly more than a holiday diversion at best."

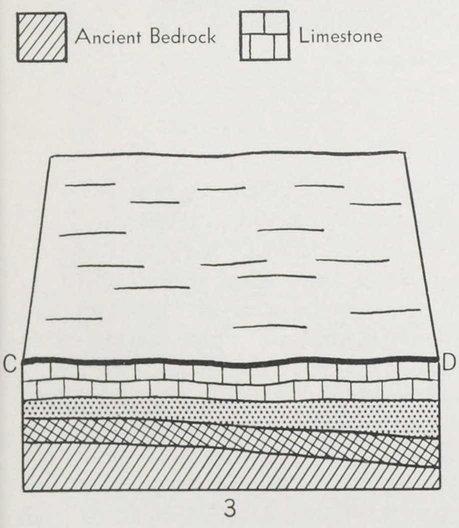
Nor does Vermont have much workable silver ore, despite persistent legends of lost mines worked by mysterious Spaniards and variously located at Camel's Hump, Worcester, Bristol and Wallingford. Silver used to be recovered in the Strafford-Vershire region as a sideline to copper mining. But copper was the big thing there. In addition to more complex ores, pure copper coats some of the rock like branching crystals of a red, never-melting frost. Vermont copper has not been able to compete with western ores for many years, but less than a century ago this region produced more than half the United States' supply.

Much more valuable today are products from the hills around Belvidere, Johnson Rochester and Reading. Long ago, hot soupy chemical mixtures oozed into that region's mountain rocks and were later changed by heat and pressure, into two minerals of major industrial importance—serpentine and talc. Vermont today is a major producer of ordinary serpentine and of silky-haired asbestos, a variety of serpentine. On Mount Belvidere you can see the huge white patches of quarries. Closely associated are soapstone and talc, softest of all rocks. Like serpentine, their industrial uses are legion although one has passed from the Vermont scene; soapstone foot warmers got many a 19th-century Vermonter through the winters.

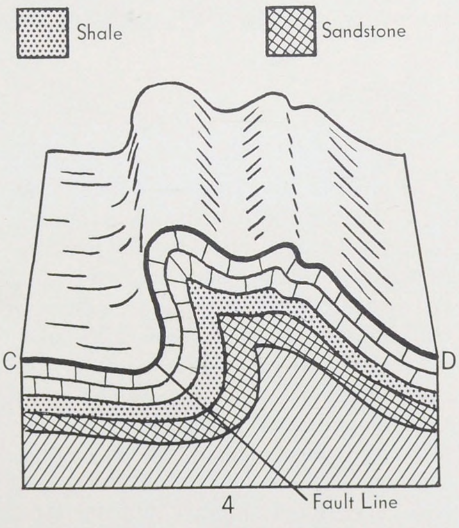
The crystallized turmoil of Vermont's Green Mountains and eastern highlands is only faintly echoed by the mildly deformed floor of the Vermont Valley. This broad rolling belt of dairy farms is Vermont's great agricultural lowland. It cuts a swath right up the state, merging with the Champlain Valley in the north. Since its rocks are only slightly altered, many are full of fossils. These compact limestones, flaky shales and gritty sandstones, are the rocks you see in road cuts along Route 7, or as rocky headlands along Lake Champlain.

Limestone is an organic sea deposit. If you scratch it and apply an acid like vinegar, it will fizz. Some Vermont limestones have hollow white nodules lined with sparkling quartz crystals; others contain pods of flint. Scattered industrial kilns today convert Vermont limestone to lime, although some is crystalline enough to be used as building stone. In fact, the Brooklyn Bridge and Rockefeller Center, as well as Burlington's St. Paul's Church, are partly of dark, fossil-filled Isle La Motte limestone.

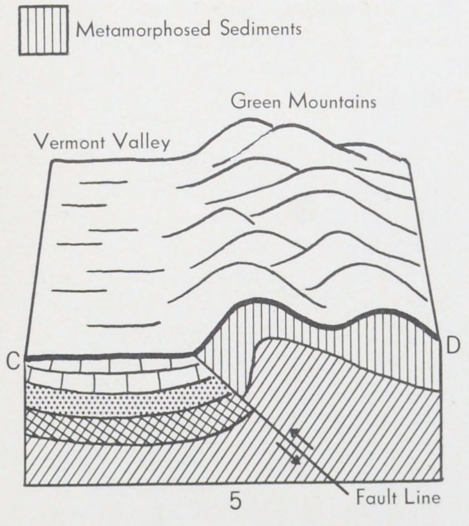
A good place for fossil hunting is Champlain's shore, especially Thompson's, Chimney and Larabee's Points, and along the mouth of Otter Creek. You can find seashells and extinct trilobites, remote



3. The sea has withdrawn. Its loose sediments have become layers of rock, and erosion has leveled their surface to a flat plain.



4. The earth's crust contracts. Pressures from the east shove the rocks into a huge ridge, and beneath the surface they crack along an enormous fault plane. The great ridge is the young Green Mountain range.



5. Today the Green Mountains are old. Long erosion has removed thousands of feet from their original crest. During the mountain-building, the rock beneath the great ridge was metamorphosed into new rocks, and the entire mountain root zone moved westward and upward along the fault.

ancestors of today's horseshoe crabs. There are worm burrows and imprints of coral-like animals—traces of little creatures that passed this way and were gone some 450 million years ago. The Champlain Valley even has entire coral reefs. The best rises as a bare rock hill on an Isle La Motte pasture, and St. Albans has a giant one 140 feet across.

Despite the relative tranquility of the Champlain Valley's past, there was a time when it was so rent by earth disturbances that a slab of its rock, hundreds of feet thick, moved westward eleven miles. You can see remnants of that slab as the low, discontinuous Monkton Hills. They lie like giant cattle all facing the same way, with steep western faces and gentle eastern backslopes. Mt. Philo is the largest. The rock which comprises them is a most distinctive red sandstone, the same rock you see in many a Burlington building. The Court House is made of it.

This rock dates back to the earliest Paleozoic. Fossils, petrified mud cracks and ripple marks in it tell us it originated as a beach and tidal flat. When you picnic at the magnificent overlook of Mt. Philo you are really standing on a beach, where tides once ebbed and flowed. But it is obviously a displaced beach. Mt. Philo and her sister hills are out of place today. Long ago they were thrust up onto limestones and shales from later seas. The original, relocated slab included not only the red rock, but younger sea deposits which had come to lie on top of it. The whole stack came to rest on other, contemporaneous sea deposits of the valley. In time erosion stripped most younger rocks from the stack and large expanses of the red rock itself, leaving the Monkton Hills as remnants.

Vermont's westerly Taconic Mountains are another migratory mountain range, far larger and more important than the Monkton Hills. From the New York border they jut into Vermont as far as Brandon. Mt. Equinox, at 3816 feet, is their highest peak. In southern Vermont the Taconics and the Green Mountains face one another across the Vermont valley like gatehouses to the state. Today the Taconics are slightly lower than the Green Mountains, but originally they were higher. And old as the Green Mountains are, the Taconics are more than twice as old.

Like the Green Mountains, the Taconics are a huge stack of one-time sediments, arched upward and most severely metamorphosed. But theirs is a shady past. Certainly they don't belong where they are. They sit perhaps 40 miles west of their undiscovered rocky roots, and are mere fragments of a rock slice which may have been 8000 feet thick. Perhaps they began as a shorn-off slab of the sediments which would some day become the Green Mountains, at a time when Vermont was emerging slowly from the last Paleozoic sea. It is not easy to picture a mountain range moving 40 miles across the state. The earth paroxysm must have been immense. Eastern Vermont's rocks felt the effects, and it was probably then that the Monkton Hills moved. Certainly this Taconic disturbance involved forces beyond our imaginings.

At any rate, the Taconics halted at an ideal place, as far as Vermont's economy is concerned. For in the heat and pressure of the disturbance, the relocated shales changed into Vermont's unique, unfading, many-colored slates. And the valley limestones onto which they were shoved recrystallized. They became Vermont's world-famous monumental marbles, later to become parts of such buildings as the Washington Supreme Court Building, the New York Public Library and the John F. Kennedy Memorial.

If western Vermont can boast slate and marble, central Vermont is a land of granite. Granite is so common east of the Green Mountains that many lakes lie in granite beds, framed with washed white granite gravel shores. Montpelier's State House is a sample of the famed Vermont granite—but a very small sample, for the Granite Hills of the Barre region are the heart of an industry in which Vermont once led the world.

The Granite Hills began as deep-rooted injections, immense upwellings of molten material which laced the bedrock after the Taconics moved but before the Green Mountains rose. Deep in their chambers in the rock, these subterranean lavas congealed into granite. Long ages of erosion eventually stripped away the softer rocks above, leaving the tougher granite exposed in knobby relief to the quarrymen.

The Green Mountains look like this today.

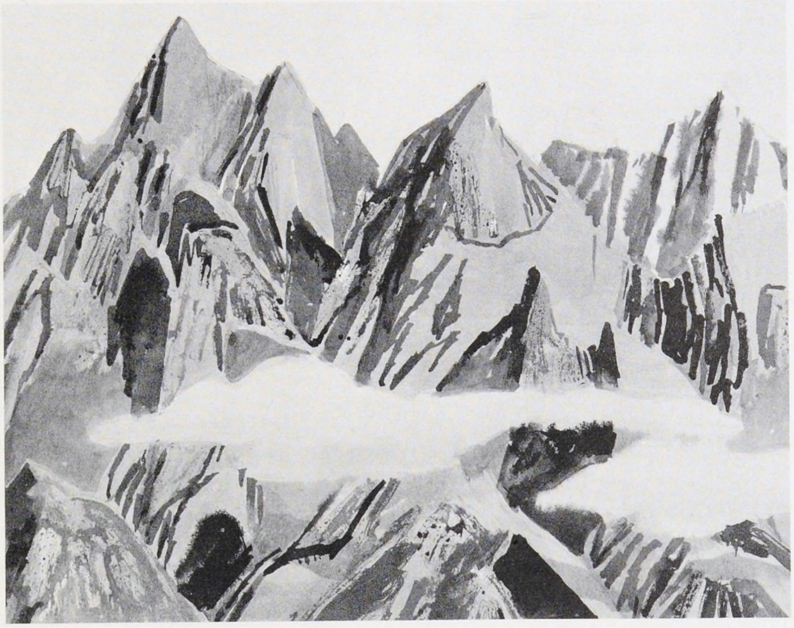
To the east of the Granite Hills rise other isolated peaks, such as Mt. Ascutney, their bedrock a close cousin to granite. Like the Granite Hills, these too are resistant holdouts from erosion, shouldering above a high plateau called the Vermont Piedmont. The Peidmont, which includes the hilly Northeast Highlands, slopes gently from the Green Mountains to the lovely, historic Connecticut Valley. It owes its generally subdued relief not only to the rapid erosional excesses of glaciers, but also—and mainly—to the slow, tireless work of streams. At its foot the Connecticut River drains some 4000 square miles of Vermont, although Vermont itself stops at the river's western shore. Indeed, the Green Mountains themselves once were eroded to such a gently rolling surface, only to be raised up again, causing the processes to begin anew.

Running waters, which can thus make plains of mountains, are among nature's greatest forces. Working with time—greatest force of all, in a sense—rivers can perform tremendous tasks. But by nature they are lazy and tend to seek easy routes.

The Connecticut River, Mad River, Otter Creek and the Ottauquechee take advantage of weak rock zones, and in places have carved deep chasms such as Quechee Gorge. The western part of the Winooski River, on the other hand, just wanders across the natural slope of an ancient delta. But at one place between Burlington and Richmond it has removed so much delta gravel that it has hit marble beneath, and has had to work harder to maintain a channel.

It is in the crystalline rocks of the mountains that rivers generally work hardest. There they flow quickly in steep narrow valleys. When they reach extra-resistant rocks they plunge over as waterfalls, and scour potholes with their abrasive loads of sand. Other types of falls result when a river bed cracks and one part is thrust up higher than the other; Otter Creek's falls in Middlebury are of this sort.

For comparison here are today's Rockies.


These are the towering Green Mountains of the past.

When such rivers reach lower lands, their valleys widen and they laze in large, serpent-like arcs across their flood plains. Otter Creek meanders so much that the Indians named it "Crooked River."

Of all Vermont rivers, perhaps the most scenic are those in the northwest and in the Taconics. Many of these have chosen the hardest paths of all. They flow *across* the mountains, heeding neither weak rocks, land slope, nor ease of travel. Apparently they began their journeys long ago in different circumstances, chosing their courses across less resisting materials, when the mountains lay reduced to a Piedmont-like surface. But the land was uplifted and the rivers were tricked; they had to work harder to hold their original channels. Yet, except during the disturbances of glacial times, they did hold them, even after they had cut through to more resistant rocks. The great water gaps of these rivers through the mountains are among the marvels of the Vermont scene. The Winooski's mountain gorge east of Richmond is 4000 feet deep.

The forces that made today's landscape may be creators of future landscapes as well. Once we are able to read Vermont's past, we can see a bit of her future too. If today's processes continue—and they have been the processes of all earth's past—we can picture Vermont's mountains leveled to a surface like today's Piedmont. At first such peaks as Mt. Mansfield will rise above it, as Mt. Ascutney today rises above the present Piedmont. But in time even the highest such peaks will be leveled by the constant erosion.

We can picture, as the postglacial uplift of the land continues, Lake Champlain spilling southward and draining into the Hudson River. It would take only one-half inch per mile of increased land tilting to allow this to happen. Meanwhile, we can picture the lake continuing slowly to silt up with debris from the crumbling mountains, until it becomes simply another river tributary to the Hudson. It might be that new glaciers will arrive one day, or new seas bringing new sediments—and eventually, perhaps, new mountains will rise from the roots of the old. . .

"Enjoy the view which is before you," said one Vermont geologist, "but if this view is to be fully enjoyed, it must be seen by eyes that really see. The delight which should come to the one to whom the view has long been familiar, to the transient guest, to the speeding tourist, is in no small degree proportional to the care which he exercises in his looking and to the understanding with which he takes it into his heart."

Whether you travel Vermont highways laid on one-time sea floors, ski her ancient mountains or fish her ice-scooped lakes, you can see more than a striking landscape. You can see valleys exalted and hills laid low; you can witness the convulsions of millenia, if you only stop to scratch the surface. ∽

Sharing your home with a restless spirit, especially if he was one of the family, need not be a scary thing, not if he's like

DAN'L THE FRIENDLY GHOST

by VIRGINIA DOWNS

Illustrations by JANE NEWTON

VERMONT HISTORY has its exciting moments if you happen to be a boy or girl in the town of Lyndon. Part of a youngster's early education is a bus trip to visit Cahoon House to hear the legend of the mischievous ghost who haunts it.

Lyndon's playful ghost is Dan'l Cahoon, ancestor of Clayton (Kit) Hoffman, who still works his great-great-great grandfather's farm nearly 200 years later.

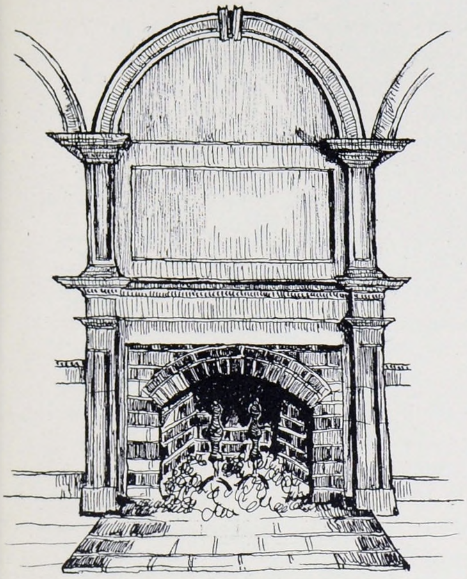
Kit refers all ghostly questions to his wife, Horty, an ex-librarian who revels in local history. Over the years her husband has willed her the job of squiring around local school children, history classes from Lyndon State College and various service clubs. This, the oldest Lyndon homestead, is rich in early history of the area, but first the young students want to establish—where does Dan'l hide?

Horty claims that Dan'l is a ghost with a sense of humor, and is quick to reassure her listener that sharing your home with a restless spirit need not be scary. Some of her younger visitors might cast wary eyes into dark corners but it isn't long before she has put them at ease with anecdotes handed down through the generations of Daniel Cahoon's descendants. Mrs. Hoffman may begin her tour by telling how she first "met" Dan'l shortly after her marriage.

She was awakened at three o'clock one sub-zero morning to the sound of the front door slamming, feet stamping and much walking about in the hallways. The next morning she asked her husband if he'd had a bad time with the furnace. He answered with a grin that he'd slept soundly through the night—"that's just Dan'l, our family ghost."

Horty says the restless spirit has disturbed her sleep in other puckish ways—by heavy breathing, boot-stamping and stair-climbing primarily. Most of the sounds, she says, come from the "haunted chamber," the room where Dan'l was laid out after his death.

The Hoffmans admit that some of Dan'l's wanderings have been rather ill-timed—when summer visitors have been staying with them. One guest reported at breakfast that the strangest thing had



happened the night before as she was sitting on the bed, rolling up her hair. All of a sudden the mattress at the foot of the bed pressed down under some unseen weight. Still another guest was awakened in the night by bedcovers being pulled off her shoulders. She was about to accuse her husband of blanket-snitching when she realized he was sleeping quietly. The blanket continued to be yanked, and a gentle tug of war ensued between guest and ghost.

Probably the strangest happening, Mrs. Hoffman tells her listeners, involved a long-time friend who reported one morning she had been awakened that night by the sound of music. She checked her radio and found it was off. Meanwhile the music grew louder and clearer. It was chamber music of the late eighteenth century. A little louder, and seemingly in the foreground, came the murmuring of voices and the tinkle of silver and glassware. Still closer to her was a young woman's soft, clear laughter. As the music started to fade she was aware of the scent of snuff in the room.

Among the many, over the years, who have had first-hand experience with Dan'l's visitations are Mr. and Mrs. Arthur Colby of Glastonbury, Conn., Mrs. Pauline de Valinger of Savannah, Ga., Mrs. Virginia Telford of Newport and Mrs. Hazel Hoffman Weiler of St. Johnsbury.

Kit Hoffman's ancestor came to northeastern Vermont as a settler in the late 1700s. A prosperous export-import merchant in Providence, R. I., Daniel Cahoon was one of many whose business careers were ruined by the Revolution and crippling taxation.

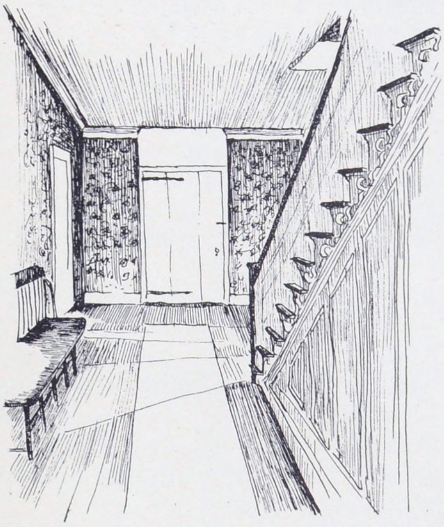
Like many men of his day, Dan'l had built in the foundation of his Vermont house a spacious wine cellar. Having successfully operated a potato whisky distillery, he was something of an expert in these matters. According to his descendants, who are numerous in northern Vermont, Dan'l's nighttime strolls really are futile searches for his wine cellar, which was sealed up after his death.

Daniel was one of a committee of prominent New Englanders to settle Lyndon. He set up grist and saw mills and later built the town's first two-story frame house, which soon became the hub of all Lyndon's early history. Squire Cahoon and son William held every public office in town the first twenty years of the town's life. They performed as probate judge, town clerk, selectman and lister. Births and deaths were recorded in their home-office and all weddings were performed in a public room upstairs, also used for state occasions, for public banquets and balls. Daniel Jr. was elected the town's first representative to the State Legislature.

Squire Cahoon had an awesome reputation among the lawyers who argued cases before him. It was said if yours was a poor case the Justice Cahoon was the last man you'd want to sit on it. If you had a good one, he was the very first one to see its merit.

The local militia regularly mustered on the Cahoon meadows under the watchful eye of Dan'l's cattle. Town mothers kept a close check on daughters at these occasions, for the expansive Squire was known to dole out his rum liberally to the tired young soldiers.

The town was stunned the afternoon of September 13, 1811, when Squire Cahoon, then 74 years-old, met his tragic death. Dashing into the barnyard to save a child, Daniel himself was gored to death by the charging bull. Madam Cahoon blamed it on too frequent trips to the wine cellar that day. As soon as the funeral was over, Madame Lillis called in the help on the farm and had the wine cellar walled up, "before," as she said, "any others of my family are destroyed by it."



Two years ago the Hoffmans put Cahoon House on the market and moved to Georgia, to try Southern living. The house was never sold (rumors of a phantom tenant may have contributed) and the Hoffmans lasted only six months in the South. Nostalgia for Vermont and the old family place setting in, they returned, aired out the old homestead and started to restock the empty barns.

And how about Dan'l? Just when they had given up expecting more night sounds, a guest came down to breakfast last summer asking who was the insomniac in the house. She'd heard a lot of walking around. The Hoffmans smiled at each other and added one more chapter to the saga.

Green Mountain
POST BOY

Rivaling World's Fairs and even those super filling stations, some very extensive flag-flying has been developing at Manchester Center. At this writing the flags of almost every state in the Union could be seen flying above the streets there. The flags, sponsored and tended by various businesses and individuals in the village, were the idea of Merchant Charles Loyzelle, who finds that, as he had hoped, "they help to make visitors feel at home."

Ronald Rood's seemingly harmless article on Vermont's snakes (Autumn, 1967), has stirred up one of the hottest reader controversies in years. Some tourist interests, of course, felt it shouldn't be admitted that Vermont *has* any snakes, but that wasn't it. Mr. Rood, readers may recall, discounted as myth and superstition reports of snakes swallowing their young when danger appeared. But there are more snakewatchers than The Postboy reckoned with, and a number of them vociferously insist they have *seen* it happen.

To this Mr. Rood concedes that it may happen—but if it does, the mother's anatomy and digestive abilities preclude the infants will again see the light of day.

Maj. Gen. John F. Ruggles in Fairfax, Virginia has spotted on a Chevron Co. map an oddity near his native Lyndonville, Vt. Where East Burke should be the map says "E. Meadow." While an inquiry has been launched, reader explanations are invited.

The egg lettering so handsomely displayed on page 59 was done for VERMONT LIFE by Miss Jennie Burch, a senior at The Woodstock Country School. The legend reads: "La vie en Vermont"—in French to fit the omelette.

That Vermonters are made of reliable and durable materials was proved again last Summer when Hosie Sargent of East Arlington retired at age 75 from the Hale Company, furniture makers. It was revealed then that in his more than 60 years of work for the firm (he started at age 15), he had never missed a day of work. But perhaps he had sometimes been tardy, for they presented Mr. Sargent with a gold watch.

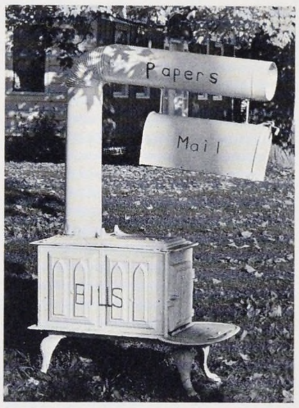
A new map of Vermont's covered bridges recently has been prepared and published by the Greater Vermont Association. It is a decorative wall map 20 by 26 inches in size, with drawings of some 50 selected Vermont bridges, done by Paul V. Winters, shown in their proper locations, accompanied by panels giving the name of each bridge and the town location. Copies of the map are available at $1.25 each, postpaid from GVA, Box 37, Montpelier.

One of the most interesting shops in Vermont, called Birdhaven, is located about two miles off Rt. 7 on Greenbush Road near Ferrisburg. The Reverend and Mrs. Warren P. Waldo have assembled here a collection of handicraft articles from India, which is said to be the finest in the country.

A handsome and useful Sportsman's Map of the Stratton-Winhall area is now available free from the International Paper Company, Box 500, Glens Falls, N. Y. The Company has done much to develop outdoor recreation facilities in this 26,000-acre woodland tract, which, with Vermont understatement, it terms a "tree farm."

Pulse rates were raised among Champlain Lake Monster fanciers last August from a discovery on the coast of Maine. A lobsterman named Richard Gagne found near Biddeford the skeletal remains of what in photographs looked like a cousin to the Champlain enigma. The apparent fish in Maine had a head about 8 inches in diameter, and the parts of the snaky body (with fins) first located measured 86 inches long. Our Monster Editor is researching the matter further.

A mailbox of more than usual interest has been spotted and filmed at North Danville by VL Scout Charlie Smith. Whether the antique chunkstove's firebox is actually used to incinerate bills is not known; nor is it established that the mailcarrier (R.F.D. out of St. Johnsbury) helpfully sorts out the mail. While Vermont mailcarriers generally have been tolerant of life-sized Uncle Sam box-holders, ingeniously converted milk cans and other strange mail receptacles, a colder view by a Washington inspector usually results in the disappearance of these imaginative devices.



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	Average Number copies	Single Issue Nearest Date
Total copies printed	123,500	127,000
Total paid dealers	41,000	43,000
Total paid subscriptions	64,000	65,000
Total paid circulation	105,000	108,000
Free	850	850
Total distribution	105,850	108,850
Office use, etc.	17,650	18,150
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Peter W. Sykas, s/s Business Manager

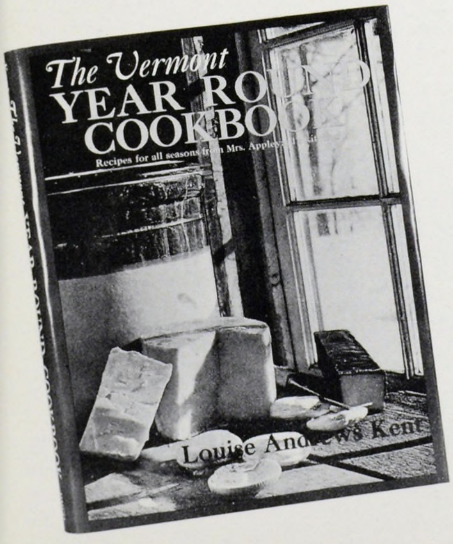
TWOFERS, ANYONE?

Step right up folks and take hold of this tremendous bargain. Get these two fine Vermont maps at half price. It's a once-in-a-lifetime chance.

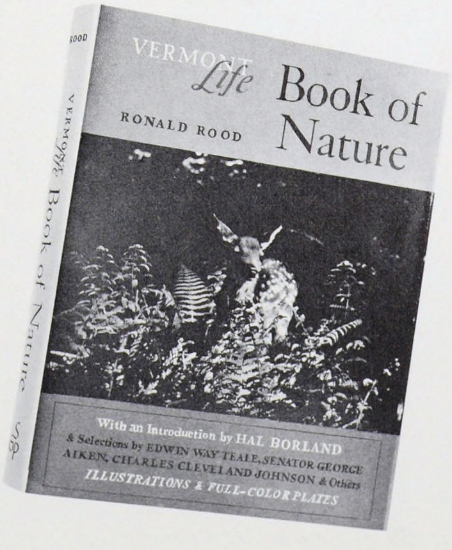
This big, beautiful four color Scenic and Historic map, drafted by Hamilton Greene for *Vermont Life*, is printed on heavy vellum. It measures a giant fifteen by thirty inches.

And Benjamin Stein's unique perspective map of Vermont's topography, done in color too, comes in an 11¼ by 30-inch size. We'll mail both maps to you rolled and protected. Look for the offer on the bind-in order form envelope contained in this issue.

This gigantic opportunity cannot be repeated and is good only until May 21. So step up now and save!



This is a good time, too for picking up a first edition copy of two especially fine and lasting Vermont books. On the left is Mrs. Appleyard's famous *Vermont Year Round Cookbook* . . . 256 pages of fine cooking lore and color plates. To the right is the highly-acclaimed *Vermont Life Book of Nature*, 200 pages of wonderful wildlife features and illustrations. List these books on your order envelope.


VERMONT
Life
Book of
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RONALD ROOD
With an Introduction by HAL BORLAND
& Selections by EDWIN WAY TEALE, SENATOR GEORGE AIKEN, CHARLES CLEVELAND JOHNSON & Others
ILLUSTRATIONS & FULL-COLOR PLATES

Ancestral preferences still obtain with regard to the versatile ovoid.
Browns are usually in favor, Mrs. Appleyard finds, but west of the mountains

SOME LIKE THEM WHITE

by Louise Andrews Kent *Photograph by* Hanson Carroll

A gentleman and a scholar of Mrs. Appleyard's acquaintance recently paid her an unusual compliment.

"In ancient Egypt," he said, "choosing a wife was compared to putting your hand into a bag of vipers hoping you would pull out an eel. I always," he added kindly, "think of you as an eel."

Mrs. Appleyard was so impressed by this tribute that she passed a restless night. Toward dawn she found herself riding a camel near the Sphinx and carrying a large sack full of something smooth, slippery and oval. She pulled out one of these objects and held it up in the rising sun: it was the only brown Vermont egg among a hundred white ones.

She woke happily, realizing that she was in Appleyard Center and the owner of two dozen eggs, ranging in color from deep pinkish brown to freckled creamy tan and that she was going to make omelettes for lunch.

Lately she has changed from an iron frying pan to a Teflon skillet with sloping sides. It is 7½ inches across the bottom and accommodates a three-egg omelette perfectly. On this occasion Mrs. Appleyard was expecting two guests. She got everything ready ahead of time; three small yellow bowls with—broken into each—three eggs, pinches of salt and pepper, half a tablespoon of minced parsley and chives from the plants on her sunny windowsill. She had another half tablespoon of chives and parsley to add to each omelette later, a tablespoon of butter apiece, three warm plates and a warm heat-proof platter. She had also made

Mushroom Sauce

1 pound mushrooms, caps only
1 teaspoon minced onion
2 tablespoons butter
2 tablespoons instant flour
1 cup rich milk
½ teaspoon paprika
¼ teaspoon pepper
¼ teaspoon nutmeg
1 cup cream
1 tablespoon sherry
salt to taste

Wash mushrooms. Slice caps vertically. Sauté onion in the butter until translucent. Add mushrooms and cook until tender, about five minutes. Remove them with a skimmer to the top of a double boiler. Now rub flour and seasonings into the butter. Add more butter if necessary. There should be two tablespoons in the pan. Remove pan from heat while you do this. Return pan to low heat and cook the roux for three minutes, stirring often. Add the milk and the cream. Simmer for five minutes and pour over the mushrooms. Leave over hot water. It is all the better if it stands for an hour. At serving time stir in the sherry.

There was melba toast, salmon roe in sour cream and Dubonnet to keep the guests busy while she was making the omelettes. It takes only a few minutes.

For each omelette: In the pan, heat the butter until it just starts to brown. This takes about half a minute and gives you just time to beat the eggs with a tablefork until whites and yolks are well mixed. Count thirty slowly while you are doing it. Swish the hot, frothing butter around in the pan so it covers the bottom and also comes up around the sides about quarter of an inch. Tip in the beaten egg, stir it well with a Nylon fork. Shake the pan as you do this. Add the extra parsley and chives. Lift the edges of the omelette and, as it begins to brown, roll it to the side of the pan opposite the handle. Let it brown more at the lip of the pan. Then tip the pan over the warm platter; with your right fist give the handle of the pan three sharp blows and the omelette will slide out on the platter. If you prefer, you may guide it out with the fork. Mrs. Appleyard likes the pounding method; says it works out her aggressions.

Turn on the electric broiler. Make the other two omelettes. When all three are lying side by side on the warm platter, pour the hot mushroom sauce over them. Put the platter briefly under the broiler till the sauce just starts to bubble.

The hot croissants served with the omelettes were made by a dear friend in Chicago who makes them much better than Mrs. Appleyard does. Her name is Sara Lee. There was also fresh asparagus with egg sauce and a dessert of fruit, Vermont cheese and oatmeal cookies, made on a crisp morning with blue shadows on the snow. If spring comes, must winter not be far behind?

Not in Vermont, Mrs. Appleyard says, and begins that evening to separate eggs for a sponge cake. One of her grandsons by adoption is going to have a birthday.

Spring Sponge Cake

Grated rind of one lemon
Juice of one lemon
6 oz. can frozen orange juice, melted, not diluted
1½ cups flour, measured after sifting
1½ cups sugar, sifted
10 eggs, separated
Sugar, extra, about 1/3 cup

Grate and squeeze the lemon. Mix grated peel and the juice with orange juice. Sift flour three times and measure it. Sift sugar once and measure it. Bake the cake in a large tube pan, lightly floured, not greased.

Beat egg whites with electric beater to soft peaks that just hold their shape. Beat four tablespoons of sugar into them. Light oven: 325°. Beat egg yolks thick and lemon colored. Beat in the rest of the sugar alternately with fruit juices and rind. Fold in flour and egg whites alternately into the yolk mixture. Mrs. Appleyard does this with a wire whisk. It is important to do it gently so that the bubbles you have beaten in will not break. They are what makes the cake rise.

Put batter into the pan, sift extra sugar over the top. It will take at least an hour to bake the cake. Open the oven door as little as possible but check the cake at the end of half an hour. If it is browning too much, reduce heat to 300°. The cake should shrink from the edges of the pan and the top should feel firm. If you have doubt about its being done at the end of an hour, turn off the oven and leave the cake in it for fifteen minutes. Then let it cool, inverted over a cake rack. Tease it gently from the pan with a narrow spatula. Invert it again, hoping it will fall out. On lucky days it does but Mrs. Appleyard often has to tailor back into place a fragment that has stuck to the pan. Turn it over again, sugar side up, on a round dish. Cut it with two forks.

Those April grandsons never worry about any imperfections. They don't leave a crumb. Happy Birthday!

Now that Spring is here come to the Apple Country

It'll be another several months before the succulent Macs, the Spies and all the other fine fruits hang red on these hardy trees.

But now, while the sweet scent of blossoms hangs on the soft, Spring air, come to the lovely orchard country.

For free information on scenic Vermont orchards to visit write to

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c/o The Vermont Development Department,
Montpelier, Vermont 05602

Cornwall, by VDD. *Middletown Springs, below, by* H. Stanley Johnson.

Comes the lure of green things growing
Comes the call of water flowing—

CHARLES GEORGE DOUGLAS ROBERTS